



Pluriactivity and professionalism in buffalo farming system: The case of Northern Greece

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ABSTRACT

Pluriactivity and professionalism in the water buffalo farming system was investigated with standardized questionnaires and in-depth interviews with breeders at Lake Kerkini National Park, Greece, where 80% of the country's buffalo population is raised. A distinction between total and complementary pluriactivity is proposed depending on including (or not) buffalo breeding as main occupation, respectively. Complementary pluriactivity appears to have synergistic effect and to encourage commerce of buffalo products to end users. Breeders not oriented to milk production tend to invest time in agriculture. Commerce seems to be encouraged by using private land for breeding (temporary pastures for early spring grazing and crop residues during summer-early autumn). Agriculture appears to be the usual alternative activity. The family character of holding and not the size of buffalo herd or the ownership status of agricultural land used for breeding seem to enhance professionalism. Simultaneous keeping of goat flocks and commerce weaken it.

Key words: Buffalo farming system, Diversification synergy, Professionalism

Water buffaloes (*Bubalus bubalis*), an integral part of livestock agriculture in Greece since the beginning of 20th century, had been providing services as well as products (milk and meat). These animals are the last representatives of the Mediterranean sub-type of the so called River buffalo (Georgoudis *et al.* 1998), and in this paper, term buffalo will only be used for them.

Due to the mechanisation and intensification of agricultural production and also to the substitution of buffalo milk by milk produced by improved imported dairy cattle, the number of buffaloes has dramatically been decreasing during the last decades. Specifically, from the 70,000 animals counted at the end of the 50s (NSSG 1960) today only 3,128 heads remain (GBBLC 2011). These animals are distributed in the central, western and northern part of the country. However, the majority of this population (2,520 heads- 80% of the whole country's buffalo population) is concentrated in the High Nature Value farming area (HNVFA) of the Lake Kerkini National Park in Northern Greece (GBBLC 2011,

Andersen *et al.* 2004, Krautzer *et al.* 2011). For these reasons the area was selected to be studied.

The buffalo farming system in the studied area is based on the utilization of natural grasslands and reflects more or less the sedentary extensive system of small ruminants, which has already been described by Yiakoulaki *et al.* (2003), de Rancourt *et al.* (2006) and Evangelou *et al.* (2008). In this system the animals have a permanent base, located around the Lake Kerkini, from where they move every morning to rangelands and return at night. Buffaloes graze in natural grasslands for 6–7 months but they also utilize alternative forage resources, including temporary pastures of annual winter cereals during early spring and crop residues during summer-early autumn (Tsiobani *et al.* 2012). In addition, farmers make extensive use of purchased feedstuffs, mainly roughage and concentrates, during the entire period of the year. Buffalo herds are pure and they are permanently herded. They are raised for milk and meat purposes (Georgoudis *et al.* 1998). Milk is used for the production of cream, butter, cheese and yoghurt. Meat and its products (minced meat, burgers, sausages and kavourmas) reach end users at butcher shops, local or not.

Pluriactivity is a term commonly used across Europe and is defined as the phenomenon of farmers to have another gainful activity that can be a diversification of the holding or an activity not related to the farm that can take place on or off the farm (Evans and Ilbery 1993, Anseeuw and Laurent

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2007). Additionally, professionalism has been defined in this study as the perception of buffalo breeding as main occupation. This definition constitutes the most acceptable (or the least vulnerable) approach of professionalism, as any possible socio-technical dimension of such a notion may only be characterized inadequately (Paddock 1986).

Several researches on buffalo farming topics focus on biological parameters such as feeding (Dixit *et al.* 1998), milk quality (Bartocci *et al.* 2002), live weight and body condition scoring (Negretti *et al.* 2008), technological interventions (Dixit *et al.* 2010) and wetlands' environmental conservation (Georgoudis *et al.* 1998, Kazoglou *et al.* 2004). However, data on entrepreneurial parameters related to breeders' personal options are very limited, though the need for more intensive research on these aspects has already been emphasized (Hermansen and Zervas 2005). Moreover, the notion of professionalism has been thoroughly explored not as a dimension of breeders' profile but rather in other aspects such as scientists' profile (Chambers and Jiggins 1987).

In this paper, the relation of pluriactivity and professionalism with the buffalo farming system was investigated in Northern Greece.

MATERIALS AND METHODS

The research was conducted during 2011 with all buffalo breeders at the Lake Kerkini National Park in Northern Greece. The climate of the area is characterized by dry-hot summer and cold winter. Mean annual precipitation is 450 mm and mean annual temperature is 15°C. The dominant woody species around the Lake are *Fagus sylvatica*, *Acer monspessulanum*, *Quercus coccifera*, *Paliurus spina-christi*, *Carpinus orientalis*, *Phillyrea latifolia*, while the most common herbaceous species are *Chrysopogon gryllus*, *Briza media*, *Bromus arvensis*, *Lathyrus laxiflorus*, *Genista carinalis* and *Lotus angustifolius*.

The study is based on standardized questionnaires and in-depth interviews with the census population (N=17) of buffalo breeders of the area. The questions concerned the animal capital, the characteristics of the holdings, the farm and breeders' profile, the utilization conditions of natural resources (natural grasslands, temporary pastures, fields of crop residues), the supplemented feedstuffs, the milk production and breeders' pluriactivity. The data were processed by using Pearson's test ($P \leq 0.05$) (Steel and Torrie 1980).

As the present research has a more specific focus on buffalo farming system, it is purposeful to define pluriactivity at intra-farm or directly farm-related level. Therefore, pluriactivity was more specifically operationalized as follows: (a) complementary pluriactivity is defined as the number of the other entrepreneurial activities, such as agriculture, other husbandry – namely goat or sheep breeding simultaneous to buffalo – and commerce of buffalo products to end users, independent of whether buffalo breeding is exercised as main occupation, and (b) total pluriactivity is

the number of entrepreneurial activities mentioned above plus buffalo breeding as main occupation.

RESULTS AND DISCUSSION

Total and complementary pluriactivity in buffalo farming system

In complementary pluriactivity (Table 1), the alternative husbandry (0.708) seems to be slightly more preferable than agriculture (0.594) and commerce of buffalo products (0.523). Although the pluriactivity in buffalo farming system has not been studied yet, Georgoudis *et al.* (1998) mention that buffalo breeding is not the only source of income and not the most important one for Greek farmers.

In total pluriactivity (Table 1), agriculture (0.683) and alternative husbandry (0.646) seem to be of similar importance, while commerce has no significance (0.280 insign.). This is understandable considering that agriculture and alternative husbandry as well as the buffalo breeding, when enhanced as main occupation, are markedly time consuming and well harmonized intra-farm or components in the framework of the total pluriactivity. On the contrary, there is no time for developing commerce which is an extra-farm activity and, as a result, it necessitates different entrepreneurial patterns and operational techniques. Thus, they do not help –or even may eliminate– the need for systematic marketing of buffalo products to end users.

According to Evans and Ilbery (1993) pluriactivity is supposed to allow achieving continued viability and reproduction of the business. Specifically, pluriactivity is expected to provide access to information, experience and knowledge, which become the basis for moving into other income activities (McGrath 1996). Kodithuwakku (1997) has proposed that pluriactivity is used to match opportunities with resources, when farms are attracted by new opportunities which consist in commerce development. Additionally, Kodithuwakku and Rosa (2002) have argued that pluriactivity makes it possible to achieve synergistic effects. However, according to our results all these hypotheses on pluriactivity seem to be supported mainly in the case of the complementary and not of the total pluriactivity. More specifically, the development of commerce simultaneously with agriculture and alternative husbandry can be achieved basically in the case of complementary and not of total pluriactivity, in which the commitment of farmers to buffalo breeding as main occupation prevents them from using further opportunities and achieve a higher synergy of different activities.

Pluriactivity and buffalo breeders' profile: The private ownership status of agricultural land (temporary pastures and crop residues) used for buffalo breeding (Table 1) seems to encourage the breeders to taking the risk of developing commerce of buffalo products (0.555). This is entrepreneurially rational as the existence of private land constitutes a sound economic basis for practicing a risky alternative activity such as commerce.

Table 1. Dimensions of pluriactivity in buffalo farming system in Northern Greece

	Exercising agriculture (no=0, yes=1)		Exercising alternative husbandry (no=0, yes=1)		Exercising commerce (no=0, yes=1)	
	Pearson coefficient	Sign.	Pearson coefficient	Sign.	Pearson coefficient	Sign.
Complementary pluriactivity (cp: fluctuating between 0 to 3) [apart from buffalo breeding, cp is defined as cp = agriculture (no=0, yes=1)+alternative husbandry (no=0, yes=1) + commerce (no=0, yes=1)]	0.594(*)	0.012	0.708(**)	0.001	0.523(*)	0.031
Total pluriactivity (tp: fluctuating between 1 to 4)[tp= cp + buffalo breeding as main occupation (no=0, yes=1)]	0.683(**)	0.003	0.646(**)	0.005	0.280	0.277
Using private agricultural land (no=0, yes=1)	-0.040	0.879	0.251	0.332	0.555(*)	0.021
Exercising alternative activity (no=0, yes=1)	0.789(**)	0.000	0.203	0.436	0.203	0.436
Developing buffalo milk production (no=0, yes=1)	-0.540(*)	0.025	-0.139	0.596	0.451	0.069

* Correlation is significant at the 0.05 level (2-tailed) ** Correlation is significant at the 0.01 level (2- tailed).

The most usual alternative activity of buffalo breeders (Table 1) seems to be agriculture (0.789). This can be attributed to the fact that the agricultural holding of Greek farmers is usually small. According to National Statistical Service of Greece (NSSG 2009) the average holding size to total utilized area is 4.4 ha. Thus, a combination of agriculture with other rural activities is necessary to achieve a satisfactory income.

Buffalo breeders who are oriented to milk production (Table 1) seem not to have enough time to invest simultaneously in agriculture (-0.540). This is understandable as milking is a time consuming procedure based on inflexible program and strict hygiene standards. On the other hand, agriculture may not be such an inflexible and demanding activity but it is still quite time consuming. Thus, milk production and agriculture development are conflicting goals for buffalo breeders. Buffalo milk production is, however, not strongly conflicting to alternative husbandry (-0.139 insign.) and it is even compatible with commerce (0.451 insign.). This can be attributed to the fact that milk production is operationally adaptable to alternative husbandry (animal husbandry is often connected with milking) and entrepreneurially compatible with commerce (enrichment with milk products).

Despite the entrepreneurial compatibility of milk production with commerce, it must be pointed out that it appears to have a positive sign but does not significantly encourage the development of systematic marketing of buffalo products to end users, which demands entrepreneurial

patterns (e.g. client-attractive behavior and manner) and operational techniques (e.g. advertising, logistics) quite different from farming.

Determinants of professionalism in buffalo farming system: In Table 2, several farm characteristics (number of buffaloes and sheep, rented and private agricultural land) which would be expected to be crucial determinants of professionalism in buffalo farming system seem to be irrelevant (0.370, -0.430, 0.387, -0.378 insign., respectively). The irrelevance of buffalo herd to the feeling of professionalism implies that qualitative parameters may be more important than quantitative ones. In contrast to sheep breeding, the simultaneous keeping of goat flocks seems to prevent professionalism (-0.540). This finding can be attributed to the higher net income that goats provide to the farmers compared to sheep (Kitsopanidis *et al.* 2009, de Rancourt *et al.* 2006). Thus, goat breeding may attract the time and financial investment of buffalo breeders. The ownership status of agricultural land (private or rented) used in buffalo breeding for the establishment of temporary pastures and crops does not seem to influence professionalism. It would be expected that breeders who rent agricultural land for breeding buffaloes to have developed a stronger feeling of professionalism. However, this is not verified by the findings of this study and comes in accordance with the statement of Georgoudis *et al.* (1998) about the secondary character of buffalo breeding.

The family vs personal character of the holding seems to seriously determine the professionalism. The number of

Table 2. Determinants of professionalism in buffalo farming system in Northern Greece

	Professionalism	
	Pearson coefficient	Significance
Farm characteristics		
Number of buffaloes (from 21 to 467)	0.370	0.144
Number of sheep (from 0 to 480)	-0.430	0.085
Number of goats (from 0 to 20)	-0.540 (*)	0.025
Rented agricultural land (no=0, yes=1)	0.387	0.125
Private agricultural land (no=0, yes=1)	-0.378	0.134
Farmer characteristics		
Number of family employees (from 1 to 2)	0.491 (*)	0.045
Family tradition (Number of breeders' generations fluctuating from 1 to 4)	0.553 (*)	0.021
Personal initiative (no=0, yes=1)	-0.627 (**)	0.007
Other entrepreneurial activities		
Agriculture (no=0, yes=1)	0.190	0.464
Commerce (no=0, yes=1)	-0.471 (*)	0.056

* Correlation is significant at the 0.05 level (2-tailed); ** correlation is significant at the 0.01 level (2-tailed).

family employees (0.491) and the family tradition (0.553) in buffalo breeding (number of breeders' generations) seem to strengthen the self-assessment of buffalo breeding as main occupation. Thus, buffalo breeding seems to be an activity based on knowledge accumulation, family networking and support. On the contrary, those who have started this activity by personal initiative (-0.627) can hardly perceive it as a main occupation. Thus, the feeling of professionalism is inspired by family rather than developed by personal interest which is often enhanced by subsidies, other financial expectations or is based on formalized knowledge disseminated via studying and consultation. Thus, tacit knowledge (obtained through the family life), the generation accumulated experience as well as family based networking and support, seem to be considered as more important by buffalo breeders than formalized knowledge. The family character of the holding and the tacit knowledge implies qualitative parameters, such as animal welfare and products' quality which a non-family holding, trying to cope with strong competition, may not observe them strictly.

On the contrary to agriculture, which appears not to be conflicting with buffalo breeding (0.190 insign.), breeders who deal with commerce cannot consider themselves as pure breeders (-0.471). This is understandable as long as a person who has end users as clients cannot identify himself as a breeder but rather tends to adopt behavioral patterns or values of the tertiary sector which are close to "urban" values and patterns.

The conclusions emerged are discussed here. Complementary pluriactivity seems to achieve higher synergistic effect encouraging the development of commerce,

in contrast to total pluriactivity which appears to prevent it. In other words, the strict commitment to buffalo breeding as main occupation is a restriction rather than a basis for a sound entrepreneurial extension and effective diversification of rural economic activities. The private ownership status of agricultural land seems to encourage the development of commerce of buffalo products, while exercising agriculture simultaneously to buffalo breeding is conflicting to buffalo milk production. These findings can be used for a more rational design of development programs in this field and for avoiding the support of incompatible activity combinations and holdings of inappropriate characteristics. The size of buffalo herd appears to be irrelevant to professionalism. Therefore, qualitative parameters seem to be more important than quantitative ones. Detecting these qualitative parameters is a question for future research. Additionally, the simultaneous keeping of goat flocks and the systematic marketing of buffalo products to end users appear to prevent the building of a professional buffalo breeder identity feeling. On the contrary, the number of family employees as well as family tradition seems to strengthen the perception of professionalism. Finally, the ownership status of agricultural land used in buffalo breeding does not seem to influence professionalism. These results can be taken into account for a more rational planning and effective implementation of agricultural extension and training programmes.

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