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АНАЛІЗ ПОГЛЯДІВ НАСЕЛЕННЯ ШОТЛАНДІЇ НА СТАЛЕ ЛІСОГОСПОДАРЮВАННЯ

Дана робота спрямована на інтеграцію екологічних, соціально-економічних та естетичних аспектів у ландшафтному плануванні для досягнення сталого розвитку лісового господарства. Основним об'єктом дослідження є вивчення існуючих у суспільстві поглядів на збільшення лісової площі у сільській місцевості та оцінка тих переваг, які можуть бути отриманні при цьому. Для вивчення емпіричного суб'єктивного підходу учасників опитування в ідентифікації найбільш важливих критеріїв цієї проблеми, а також оцінки основних чинників, які впливають на різноманіття поглядів, у роботі використано Q-методологію. Окремі інноваційні перспективи, які стосуються консенсусу та конфлікту між людьми стосовно сталого розвитку лісового господарства допомагають зрозуміти: чому окремі аспекти лісової політики підтримуються одною частиною населення і не підтримуються іншою. Через різницю у поглядах учасників стосовно інтеграції лісової площі у природні ландшафти ми отримуємо важливу інформацію про пріоритети суспільної думки, а також про чинники, які стримують подальший розвиток лісового господарства. Результати дослідження дають змогу краще зрозуміти, яким чином різноманіття суспільних поглядів на зміни у землекористуванні впливають на вибір та оцінку рішень у сталому розвитку лісового господарства, а також яким чином ініціювати соціальну зацікавленість та активність у вирішенні цих проблем.

Ключові слова: сталий розвиток лісового господарства, ландшафти, суспільна позиція, Шотландія.

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Analysing public attitudes toward sustainable forest management in Scotland

This paper focuses on a proper integration of ecological, socio-economic and aesthetic aspects in landscapes planning to attain sustainable forest management. The primary research objective is to assess existing opinions concerning the expansion of woodlands in rural landscape and to provide a sharper insight into values and preferences held by the public. The paper employs Q-method to examine empirically human subjectivity and to identify important criteria of the respondents' perspectives, as well as major factors influencing attitudinal diversity. The paper suggests some innovative perspectives on the areas of consensus and conflict between people and assists in realising why certain aspects of forest policies are unfavourably viewed by some people and favourably received by others. Through a different importance accorded by the respondents to the integration of woodlands in rural landscapes we become aware of the public priorities and of the factors that can hamper forest development. The research outcomes add to understanding how the diversity of opinions on land-use changes influence the selection and evaluation of forest management decisions, and how public participation can be facilitated.

Keywords: sustainable forest management, landscapes, public attitudes, Scotland

1. Introduction

Since the early 1990s, dominant attitudes to countryside have changed radically in many parts of the world, including Scotland. An increasing interest in mul-

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ti-functional forestry has been observed. Its transition to multiple objectives, particularly related to the environmental services necessitates operationalising social values into concrete management decisions, where the shift from a production-focused model to a people-focused concept is crucial (Nijnik, Mather and Hill, 2005). These changes in forestry development, amounting in effect to a paradigm shift toward "post-productivism" (PP) in the countryside (Mather, 2001), provide formidable challenges for practitioners: how can dominant attitudes concerning forestry be characterised, and how can they or should they be translated into policy? What is the future of forestry in Scotland? What are the linkages between the objectives of sustainable forest management (SFM) and the delivery mechanisms for multi-functional countryside development?

This paper examines public perceptions on the future of forestry in Scotland within the distinctive setting of woodlands expansion and in relation to rural policies formulated in recent years. The structure of the paper is as follows. Firstly, research methodology is presented. Then, the existing opinions concerning forestry development are defined and analysed. Finally, the results provide some indication of linkages between SFM and multiple (ecological, socio-economic and aesthetic) objectives of the delivery mechanisms of schemes for rural sustainability.

2. Methodology

2.1. General overview

Assessment of existing viewpoints and values has been a difficult task. Surveys, CVM, focus groups, and multi attribute utility analysis (MAUA) have been employed to communicate public perceptions among diverse objectives (Steelman and Maguire, 1999). However, surveys and CVM suffer from difficulties in designing, administering the questions, and interpreting the results. Focus groups are often unrepresentative, and no methodical guidelines exist to draw out a systematic understanding of their value-relevant information. MAUA is too difficult for understanding (Keeney and Eppel, 1990). In contrast, Q-method (Stephenson, 1963) provides a sharper insight into values and preferences held by the public. Q-method helps researchers to outline the areas of consensus and conflict between people, to specify, select and evaluate policy options.

Q methodology can be used in all phases of the policy process: intelligence, promotion, prescription, invocation, application, termination and appraisal (Laaswell, 1971). This paper considers consultation with the people to receive knowledge on the diversity of existing perspectives, concerning rural changes with relation to forestry development in Scotland. When, as concerning a countryside change, input from local communities is important, this methodology is unique as its results are largely driven by the public, and all at once they are systematic and statistically rigorous (Barry and Proops, 1999). Although to empirically examine human values and beliefs is difficult, Q-method helps to elucidate the range of public perspectives that exist and the spectrum of sustainability to which they may relate. It makes possible a nuanced analysis of attitudes and of the elements of which they are composed (Nijnik, Mather and Hill, 2005).

Q-method is a quantitative tool for examining human subjectivity. It enables researchers to reveal and assess attitudes and perspectives from the standpoint

of the person (s) being observed (Brown, 1996). Q-method allows for a rather simple data set, and its factor analytical tool makes it possible to analyse interviews even when the respondents have not explicitly revealed their opinions.

The following basic features distinguish Q-method from standard survey analysis (R-analysis) (McKeown and Thomas, 1988; Barry and Proops, 1999):

- R-analysis deals with patterns across objective variables (e.g., gender, income) and yields statistically generalisable results. Q-analysis deals with subjective perspectives across individuals, and results in typologies of views that prevail in a given situation.
- With R-method, correlation summarizes the relationships among traits and then factor analysis denotes the clusters of traits. With Q-method, correlation summarises the views among people, and resulting factors represent points of view. The method does not define the number of people with certain beliefs, but denotes what beliefs people have and why.
- Q-method employs small number of respondents, because most of the data derives not from the number of participants, but from how much information is implicit in each participant's Q sort. As few as twelve respondents with diverse views generate statistically meaningful results in terms of the range of implicit discourses uncovered; and even single-person surveys are used in certain cases.

Though the body of literature on Q-method is growing, the subset of forestry related research employing it is rather small. The methodology has been used e.g. to define attitudes toward agrarian reform (Peritore and Peritore, 1990), to understand participant perspectives in national forest management (Steelman and Maguire, 1999), to measure attitudinal diversity of Siberian forest policy makers (Mashkina, 1998), and to conceptualise the perspectives of forest policy actors in Ukraine (Nijnik, 2002; Nijnik and Oskam, 2004).

2.2. The outline of Q-analysis

Existing attitudes towards land use changes were analysed through interviews. After pre-testing of the questionnaire within the Macaulay Institute, and then improving both the statements and the procedure, eighty six random respondents were asked to rank order the responses by placing the statements (Appendix 1) in the normal distribution chart (Appendix 2). Each respondent was asked to distribute the statements (their numbers) across boxes in the chart, according to his or her agreement/disagreement with each of the statements.

Naturalistic statements generated through concourse analysis were used in this study. The statements included various aspects that concern economic, environmental and social dimensions of countryside sustainability and rural management, and those that concern landscape components, first of all forests with a clear distinction between native woodlands and conifer plantations (Figure 1)¹.

After the respondents had ranked the statements across the normal distribution, which encouraged them to consider the relationships among the statements more systematically, the output data were assessed, using the sequential application of multiple regression and factor analysis. Factor analysis reduced the dimensionality of the data by creating a few new uncorrelated choice variables (a set of factors or typical Q-sorts) which have captured the common essence of the several

¹ Definitions of sustainability are explained in Appendix 3.

individual Q-sorts. The research therefore provided identification of the groups of people with their views, according to the orientation of the blocks of statements (Appendix 4).

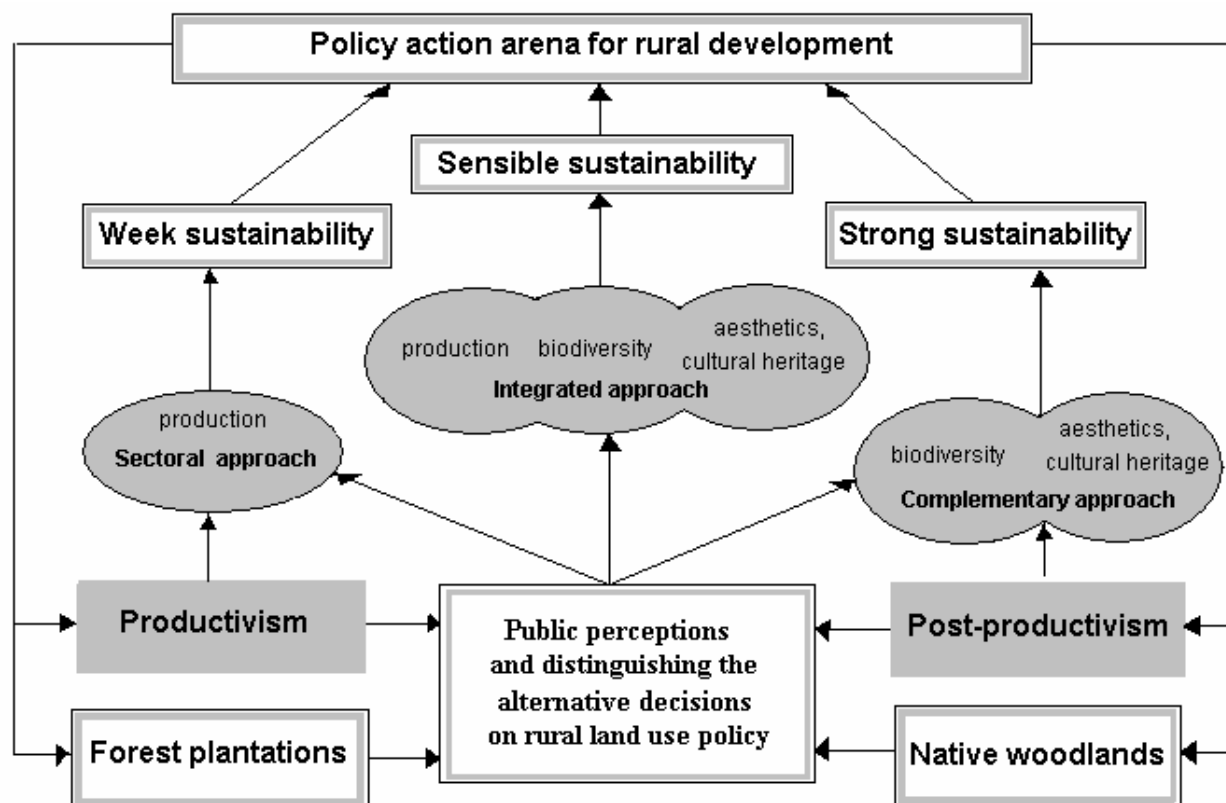


Figure 1. The logical framework to explore existing in Scotland attitudes toward the expansion of woodlands in rural landscapes

Then, the distinguishing statements across the factors were analysed and social discourses uncovered by the statistical analysis were given. Finally, factors influencing attitudinal diversity were defined and explained. Statistically analysed socio-economic background of the respondents (gender; age; education; occupation; income etc. revealed in course of the survey) was considered to elucidate its influences on the perceptions.

3. Results

In course of the survey, people living in different areas expressed their opinions on the problems of countryside sustainability (its economic, social and environmental components), and concerning rural changes and the development of forestry (natural woodlands expansion vs. forest plantations). The research objectives were, as follows:

- Distinguish possible alternatives for the development of forestry in Scotland;
- Analyse public attitudes toward countryside sustainability and to landscape changes, with a special focus on woodlands expansion;
- Define factors influencing existing attitudes;
- Explain these factors by analyzing the respondents' socio-economic background.

The results of the analysis¹ provided evidence in support of the policy that promotes tree-planting and expansion of woodlands in Scotland, as offering a wide

¹ 86 respondents have been asked, and 80 rigorous results have been obtained.

range of benefits to its people, economy, and to the environment. How do people substantiate the necessity of woodlands development (Figure 2)?

The creation of new jobs in remote rural areas and the provision of employment opportunities related to the prospects of woodlands expansion (also through the development of tourism and recreation) possess an important place in people's way of reasoning. The respondents, who belong to the so-called groups of Pragmatists and Realists, consider social security and a balanced timber harvesting as the most important directions of SFM. They support the weak sustainability concept for rural development rather than that of a strong sustainability. Also, showing a clear emphasis on woodlands expansion, these people often reject strict nature conservation and consider the social aspects of forestry development crucial.

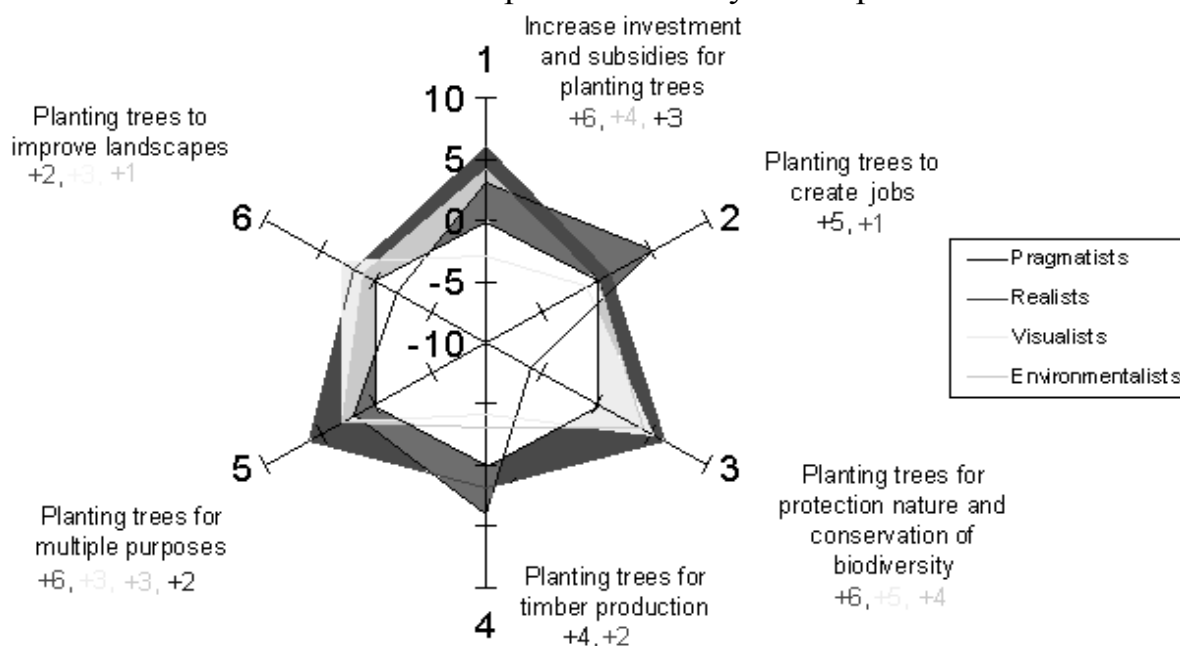


Figure 2. Attitudinal diversity of the public toward SFM in Scotland

Major difference between the most clearly defined groups of Pragmatists and Realists is that whilst the first group's vision is practical (socio-economic), as these people focus on the enlargement of wealth of rural communities, on the creation of new jobs and on the increase of investment in rural areas, the outlook of the second group is all at once ecological. It is oriented toward balancing of socio-economic objectives of woodlands expansion with nature protection considerations, with a special emphasis of native woodlands conservation for the benefits of present and future generations.

The second major reason for public support of the policy of woodlands expansion in Scotland is that people recognize the role of forests for improving of rural landscapes, for nature protection and biodiversity conservation. The two groups of people supporting this vision (the so-called Idealistic and Utilitarian Visualists) are preoccupied primarily with aesthetic values of landscapes and with people's rights to enjoy landscape's beauty. In addition, Utilitarian Visualists are interested in economic and social aspects of landscape changes, e.g. in the attraction of tourists in remote rural areas.

The Environmentalists highly appreciate the intrinsic values of nature and are primarily ecologically oriented. Whilst all other groups do not have strong pre-

judice against an enlargement of wooded area at the expense of non-native species, the Environmentalists support native woodlands conservation and their extended regeneration.

The research has also defined main factors influencing public attitudes and explained these factors by analyzing the respondents' socio-economic background:

- The majority of Pragmatists are highly educated people with high salaries, who have families with children and live in countryside.
- Realists include a wide variety of people who live both in urban and rural areas.
- Visualists are mainly scientists or highly educated civil servants of middle ages, women or men with children, who are well paid. They mainly work in towns and live both in urban and rural areas.
- Environmentalists are largely those who have a university/college education and moderate salaries. They often live in towns, but have strong connections with countryside (via relatives, through recreation activities, etc).

The results of the analysis have not distinguished differences between subjective perceptions of female and male respondents or people who live in different areas of Scotland. Yet the social perspective of the research has shown that the attitudinal diversity depends on age and living conditions of the people and still more on their competencies, such as work experience, occupation etc. The outcomes have provided insights for understanding why certain aspects of forest policies are unfavourably viewed by some people, and favourably received by others. Through a different importance accorded by the public to the integration of woodlands in rural landscapes, we become aware of existing priorities and of factors that could hamper reforestation of rural Scotland.

4. Conclusions

The research has provided insights into respondents' preferences, concerning the integration of ecological, socio-economic and aesthetic aspects in sustainable land use management in Scotland, with a particular focus on woodlands expansion. The developed preference models have distinguished public attitudes toward forest policy and provided some innovative perspectives on the areas of consensus and conflict between people, regarding the key directions of forestry development. The results of the Q-analysis enabled us to identify important criteria of the respondents' perspectives, and to explain major factors, influencing attitudinal diversity.

The use of Q-methodology in this setting has offered a potentially useful contribution to the formulation and refinement of forest policy. The research concluded that although some people in Scotland are in favour of native woodlands regeneration, whilst others have interests that come very close to the weak sustainability ideas, there is a general consensus on the necessity of extensive/proper integration of woodlands in rural landscapes. There is a common understanding that sustainable countryside development is the right direction in which to go in order to multiply benefits to society and to the environment in Scotland. The major focus of SFM in this country must therefore be on the necessity of operationalising of social values into concrete forest management decisions, where the shifts from timber management to multiple resources management, and from a forest-focused concept to a people-focused concept, are crucial.

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Appendix 1: Some statements

I support the creation of large areas of woodlands, but any new planting would have to be in tune with the character of the landscape.

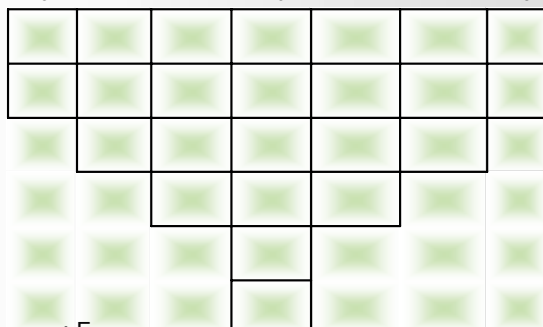
We should be more self-sufficient in timber and plant fast growing trees, making sure that our forests produce as much wood as possible.

I don't mind what type of trees gets planted or where trees get planted, as long as it doesn't cost the taxpayer money.

Native woodlands are an important part of our natural heritage and should be preserved whatever the cost.

Appendix 2: Normal Distribution Q-sort chart

Disagree -3 -2 -1 0 +1 +2 +3 Agree



Gender: M ____; F ____
 Age: under 30 ____; 30-40 ____; 40-50 ____; over 50 ____
 Education: School ____; College ____; University ____; PhD ____
 Occupation: ____
 Annual income: below ?15000 ____; ?15000-?25000 ____; 25000 or higher ____
 Partnership status: ____
 Number of children: ____

Appendix 3

Sustainability has several levels – week, sensible and strong – depending upon how strictly one elects to conform the concept of maintenance of non-declining capital.

Week Sustainability is maintaining total capital intact without regards to the composition of that capital between its different components (natural, man-made, social or human). This would imply that different kinds of capital are perfect substitutes at least within the boundaries of current levels of economic activity and resources endowment.

Sensible Sustainability would require that in addition to maintaining the total level of capital intact, some concern should be given to the composition of that capital between natural, man-made, human and social. Thus oil may be depleted as long as the receipts are invested in other capital (e.g. human capital development) elsewhere, but that, in addition, efforts should be made to define critical le-

vels of capital, beyond which concerns about sustainability could arise. Such critical levels should be monitored to ensure that the patterns of development do not promote a total decimation of one kind of capital, no matter what is being accumulated in the other forms of capital. This still assumes that man-made and natural capitals are to a large extent substitutable, but it is recognised that they are complementary too. The full functioning of the system requires at least a mix of different kinds of capital. Since we do not know exactly where the boundaries of these critical limits for each type of capital lie, it behoves the sensible person to err on the side of caution depleting resources (especially natural capital) at too fast a rate.

Strong Sustainability requires maintaining different kinds of capital intact separately. Thus for natural capital, receipts from depleting oil should be invested in sustainable energy production rather than in any other asset. This assumes that natural and man-made capitals are not really substitutes but complements in most production functions. A saw-mill (man-made capital) is worthless without the complementary natural capital of a forest. The same logic would argue that if there are to be reductions in one kind of educational investment they should be offset by other kinds of education, not e.g. by investment in roads.

Appendix 4: Factor loadings ^[1] whilst analysing Visualists' outlook ^[2]

QSORT	1	2	3	4	5	6
4	0.0939	0.0218	0.2364	0.4030	0.5295X	0.3374
18	0.3140	0.1362	0.0161	-0.1313	-0.5438X	-0.1370
19	-0.1088	0.6592X	0.1567	-0.3501	0.3556	0.0473
21	0.0771	0.6380X	0.3514	0.1228	-0.0503	0.4068
22	-0.3668	0.5107X	-0.0542	0.3301	0.1796	0.4389
27	-0.5363	0.7206X	0.0231	0.0254	0.1854	0.0349
28	-0.0100	0.7540X	0.0026	-0.0523	0.3468	0.1412
29	-0.0424	0.5319X	-0.0453	0.6254	0.0209	0.1502
30	-0.4273	0.5714X	-0.2308	0.0734	0.2459	-0.0301
31	-0.2516	0.6918X	0.0603	0.1509	0.3636	0.0292
32	-0.4882	0.6571X	0.0404	-0.3186	0.0416	-0.0484
33	-0.0799	0.7062X	0.0999	0.3507	-0.0129	0.1789
34	-0.3155	0.7507X	-0.2552	0.2752	-0.2595	-0.0506
35	-0.6386	0.5004X	0.0838	-0.3384	0.1117	0.1613
36	-0.4823	0.6988X	0.2856	0.1475	0.0685	0.0456
37	-0.5130	0.5978X	0.2290	0.2083	0.0002	0.2231
39	-0.3726	0.5778X	0.4196	-0.0786	0.0269	0.2283
40	-0.0934	0.5856X	0.2135	0.1058	0.2149	0.3004
47	0.0811	0.3408	-0.1226	0.3862	-0.5530X	0.3198
49	0.1001	0.4336X	-0.0004	-0.2117	0.2816	0.0053
52	-0.2405	0.1851	0.4000	-0.0810	0.5213X	0.1632
54	-0.1135	0.7025X	-0.1781	0.3496	-0.1546	0.1359
61	-0.3613	0.0477	0.0431	-0.0649	0.8515X	0.1981
62	-0.2739	0.1463	0.1410	0.2399	0.8458X	0.0731
63	-0.5370	0.0704	0.1115	-0.1059	0.7780X	-0.0880
64	-0.3690	0.1099	0.1429	-0.0404	0.8299X	-0.0090
65	-0.3660	0.1969	0.1534	-0.1992	0.7759X	0.0591
% expl.Var.	27	14	7	8	10	7

^[1] An individual's loading on a factor is a correlation coefficient that indicates the extent to which each Q-sort is similar or dissimilar to the composite factor array. A positive loading indicates that the person shares subjectivity with others on that factor, whilst negative is a sign of rejection of the factor's perspective.

^[2] Group 2 represents Idealistic Visualists; group 5 - Utilitarian Visualists. X indicates a defining sort. Dominating indicators are those with factor loadings ? 0.5 or ? - 0.5;

^[3] % expl. var. means that the first factor explains 27% of the variation, the second factor explains 14% of the variation and so on, and this is when all 80 Q-sorts are considered.

Those who would demand that strong sustainability would never deplete anything are pushing the idea to absurd level. Non-renewable resources – absurdly – could not be used at all; for renewable, only net annual growth rates could be harvested, in the form of the overmature portion of the stock.

Source: Serageldin, 1995

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Лідія Заднік-Штірн – Університет в Люблянах

ПІДХІД БАГАТОКРИТЕРІАЛЬНОЇ ОПТИМІЗАЦІЇ ДО МЕНЕДЖМЕНТУ ЛІСОВОГО ГОСПОДАРСТВА З УРАХУВАННЯМ БАГАТОЦІЛЬОВОГО ВИКОРИСТАННЯ

Враховуючи, що менеджмент лісового господарства дуже важливий для забезпечення рівноваги в економічних, екологічних і соціальних цілей, ми представляємо багатокритеріальну і багатовимірну модель підтримки прийняття рішень. Вона дає змогу визначити оптимальне управлінське рішення з урахуванням вимог сталого розвитку і різноманітного використання лісів. Запропонована модель підтримки прийняття рішень розглядає процес менеджменту лісового господарства з урахуванням стану, рішень, цільових функцій та зважених вартостей. Оскільки стан лісу описують з допомогою суб'єктивних і недостовірних змінних, ми використали апарат нечіткої логіки. Відтак лінійна функція корисності, багатовимірний аналіз та аналіз ієрархічних процесів використано для оцінки конфліктуючих цілей землевласниками, експертами і громадою, а також для схвалення оптимального рішення, тобто рішення, яке має найвищу компромісну оцінку.

Ключові слова: менеджмент лісового господарства, багатокритеріальна і багатовимірна модель підтримки прийняття рішень, багатокритеріальна і багатовимірна модель, методи нечіткої логіки.