

## FOREST PROTECTION, CONSERVATION AND MANAGEMENT: INTEGRATION OR SEGREGATION?

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### ABSTRACT

The desire to protect, conserve and utilise life-supporting resources is a deeply rooted primordial, pre-forestry human trait. Consequently, forestry originated as integrated multi-resource social forestry responding to diverse human needs. Rising European mercantilism and proto-capitalism introduced concepts of maximising single functions to increase production, profits and shareholders' values. The dichotomy between traditionally integrated and new-world segregated forestry in teaching, science and practice deepened. The public and political environments were affected by confusion and traditional forestry by the consequently blooming ideologies, romantic myths, sectarian dogmas and wishful illusions. Political correctness replaced common sense and good science with predominantly negative effects on forests and forestry. It became fashionable to deny that adequate practical experience and scientific knowledge are available for a dynamic, integrated and sustained multiple-resource, multiple-purpose forestry which combines production functions with conservation and protection, and integrates forestry with surrounding activities. The Sabal-Simunjam case in Sarawak shows that this combination and integration are practicable and can be successful, but disturbing causal factors outside forestry will cause failure if they are powerful. Major obstacles to maintaining or restoring sustainable integrated forestry as part of general land use and development are the state of the global economy, the dismally low and declining standards of politics, governance and education, and the underlying corrosion of ethics and morals.

**Key words:** Sustainability, integration, segregation, maximising, optimising, risk, uncertainty, ecosystem, environment.

### 1. What and where are the roots?

To protect territory and conserve resources are basic human instincts. Tribal hunter-scavenger-collector and shifting-agricultural societies have at all times and in all parts of the world conserved their resources by customary norms, such as the Malaysian *adat* and protec-

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ted their territory by the strength of the sword; they either perished or migrated if they failed. Increased population density and cultural sophistication closed the loop-holes of migration. Different strategies were needed; one of these was regulated, professional forestry which has its roots in Central and Western Europe (WESTOBY, 1987, p.118). It began in the Frankonian period and grew by trial and error, and eventually by scientific research, teaching and training, to contemporary maturity in a constantly changing world (Fig.1).

While resource over-use, timber mining, enclosure and social exclusion were mitigated in Central Europe in the course of often painful social and political reforms and technical advance, a new threat to sustainability in forestry arose since the mid-19th century in the form of the new class of ruthless and self-centered stake- and shareholders - the capitalist investor, the Marxist-socialist dreamer and the uninformed but demanding public. One of the consequences was that European forestry, as art and science, split into two opposing schools with fundamentally different *Weltanschauung* (ideological view of the world) and approach to conservation and protection functions. Naturalistic foresters retained the traditional holistic concept of ecological and social integration, achieved adequate economic performance by working with nature, and applied adaptable and integrated low-impact harvesting, low-risk and low-investment silviculture and multiple-use management. By mid-20th century, plant and animal species richness (*Artenreichtum*), spatial distribution (frequency, *Artenhäufigkeit*) and abundance (*Deckungsgrad*) had become regular components of the curriculum in forest ecology-plant sociology (*Waldbaugrundlagen*) and of forest management planning and monitoring (*Forsteinrichtung*). Tree species mixture and biodiversity were used as ecological indicators and tools in practical silviculture and protection and adopted as economic objective of management to reduce ecological and economic risks and improve multiple-states, -processes, -functionality and forest aesthetics.

In contrast, the new proto-capitalistic version of forestry in 19th century Central Europe gave priority to shareholder values over stakeholder needs and accordingly designed intensive plantation forestry with “power-pole stands” to maximise production, profits and present net worth. Conservation and protection functions were segregated from production and allocated to special, separated areas. Ignoring the role of diversity, risks, uncertainties and constant changes in the real world, the intensive “normal forest” plantation management rarely achieved its objectives. The more obvious failures were attributed by an ignorant public to the incompetence of professional foresters and to forestry as a whole.

At a certification seminar in Germany earlier this year, a prominent forestry aid official asserted that the opinion, common among foresters in Germany, that certification only makes clear to everybody what forestry has been doing for two hundred years is wrong, and that sustainability is very much more (cited by KRONAUER, 2001). If this implies that German foresters adhere to a narrow, low-key concept of sustainability, or do not know what it is altogether, the assertion is wrong and misleading as the history of forestry in Central Europe and many tropical countries clearly shows. The causal root factors of failures lie in the wider economic, social and political environments.

## **2. How did all the confusion come about?**

With this lesson learned, the current resurgence of intensive industrial plantation forestry and the spread of timber mining in some parts of the world is astonishing. The results suggest to

the ignorant public that production forestry is incompatible with the protection of nature and the environment and with multiple-resource conservation. Therefore, production, protection and conservation must be segregated.

The rush for “uncontrolled, haphazard and mobilisation” of the natural forest resource in the tropics since the 1960s, watched helplessly by weakened forest services (WESTOBY, 1987, p.3-70) created another distortion of the image of forestry. Wasteful, resource squandering and environment damaging timber mining was interpreted by environmental activists as an essential feature of traditional forestry. Illicit logging, illegal trading and the high but unaccounted social costs deepened the growing prejudice against forestry in the media and public. It became fashionable to believe that the pristine tropical rainforest was in a harmonious and balanced state, but so fragile that any interference by forestry would spell disaster until complete knowledge of the ecosystem has been acquired, which is an illusion.

The opposite, equally untenable view held by loggers and politicians was that customary logging would cause no harm and that, anyway, the tropical rainforest growing stock was a wasted asset which should be speedily activated for the sake of economic development, shareholder values and the aim of maximising present net worth of assets.

These confusions, illusions, animosities and contradictions stimulated conflicting and contradictory demands such as:

- logging should stop in all, or in all remaining unlogged tropical rainforests and the areas should be closed and totally protected
- all “large-scale” commercial logging in natural forests, in “high extinction risk ecoregions” and in “forest frontiers and other significant tracts of intact or near-intact forests in all tropical ecoregions” should be stopped and the areas be totally protected, while all biomass production functions should be transferred to intensive timber plantations which could supply all local to global needs (segregation of functions)
- forestry, because of its inherent (predatory) nature, should be stripped of any responsibility for nature conservation, species protection and non-production functions and services which should become the responsibility of agencies outside forestry (segregation of functions)
- traditional foresters and forestry, because of their long experience and good record should be responsible for all protection, conservation and production functions of the permanent forest estate which must be integrated at all spatial scales of planning and monitoring (integration of functions).

New myths and illusions are being promoted and have become popular in the Global Climate Change (GCC) context and the predicted impending ecological collapse. It is a wishful illusion that we can control climate and climate change or that forestry and the tropical rainforests play an effective role as regulator of global climate and hydrological cycle (for sober factual details see UNESCO/FAO, 1978, part I, chapt. 2). Another chimera is the wishful belief that reduction of the excessive damage of customary logging by reduced impact logging (RIL) would almost be synonymous with sustainability and, together with afforestations, could mitigate the global atmospheric carbon problem and GCC. What is really effective is the combination of state-of-the-art Low Impact Harvesting (LIH) (DITZER, 1999) with low-intensity silviculture and multiple-purpose management, but for other

reasons. The only feasible approach to mitigation of GCC is adaptation of lifestyle, resource use and politics, all of which lie outside forestry.

### **3. Some further problems**

The public misconception of the nature and role of forests and forestry perniciously resists enlightenment and correction. The very features of natural forest ecosystems which provide robustness, elasticity and resilience are believed to make them vulnerable and untouchable, which strongly supports the demand for segregation of functions. The fashionable concepts of participation and native forest management are advocated without possessing the necessary knowledge of native customary law, native expertise, value systems and customary land-use practices. Existing customary, constitutional and statutory instruments of the democratic infrastructure which regulate native participation are ignored. Novel ways of native involvement in forestry require expertise, motivation, understanding, tolerance and adaptability on all sides, that are rare to find. Customary native forest management has principles and objectives which are essentially different from those of professional sustainable forestry. New concepts of community-based and communal forest management have a reasonable potential for success but equally so for failure, especially if the priorities are conservation and protection.

While there may not be an ecological crisis caused by forestry, irrational lifestyles causing GCC promise a real and critical disaster. Deteriorating conditions of local and regional climate and hydrology will affect life-support systems, threaten quality of life and thereby seriously undermine social and political stability. The current trends in agriculture, forestry and manufacturing towards global uniformity and homogeneity increase ecological, economic and social risks and uncertainties, and erode quality of life. The consequences for social development, cultural evolution and the sustenance of a balanced man-biosphere partnership are predominantly negative.

### **4. How sure can we foresters be of our claims?**

The question is how certain are we foresters that our claims are well-founded on sound science and experience that we know at least enough to assert that:

1. controlled and proper low-impact harvesting alters the forest growing stock structure only temporarily and impacts do not exceed the natural elasticity and resilience of the ecosystem against disturbance.
2. the combination of state-of-the-art low-impact harvesting and low-intensity, low-risk silviculture adequately protects rare or unique species, ecosystems, biodiversity and ecological processes; so far no loss has been reliably documented which could be blamed on forestry.
3. comprehensively sustainable timber production and yield can be achieved and maintained in natural tropical forests by established silvicultural management systems to produce a diversity of high-quality timbers for which demand will increase as education and lifestyles improve.

Few of the early sustainable forest management areas, long-term research projects, plots and data sets have survived after the Second World War. Even fewer have been adequately evaluated. New research often simply re-invents the wheel, or is isolated and irrelevant, but wherever it is relevant and connected, results invariably show proof that there is no evidence of massive or sporadic extinction of species, loss of habitats, biodiversity or genetic material by low-impact timber harvesting (LIH) and low-intensity naturalistic silviculture (LIS). On the contrary, LIH and LIS may increase taxonomic and physical forest biodiversity (DROSTE, 1996; POKER, 1992, 1995; SHEIL and VAN HEIST, 2001).

As more data become available on the geographic range of species and ecosystem types, we realise that in many cases their ranges are much wider and local ecosystem complexes and landscapes much more regionally representative than earlier information indicated. Procedures are available to survey and evaluate this heterogeneity and diversity of site, vegetation, capacities and risks for purposes of planning and monitoring integrated forest management, conservation and protection (e.g. GLAUNER, 2000). Risk of harm to the edaphon, soil biochemistry (e.g. PROCTOR, 1999) and of nutrient losses due to harvesting operations (NYKVIST, 1998,2001) are not very well documented, but understood well enough for designing precautionary measures, such as LIH combined with site-specific LIS. Simply lowering excessively high damage levels by reduced impact logging (RIL) or enrichment planting are just not enough.

Forest and landscape ecosystems are by their very nature fuzzy and prone to develop unpredictably into unexpected states. Positive feed-back loops create risks and uncertainties of performance and future state of the natural ecosystem. The same applies in principle to economic, social and political systems which affect planning and performance of forest management. Comprehensive risk analysis and consideration of uncertainty are equally indispensable for the decision on location and management system of totally protected areas whether they are integrated components of the production forests or the landscapes outside.

Planning under these conditions requires system approaches at all levels from tree, stand, forest enterprise or forest management unit (FMU), economic region to nation. System analysis, including modelling and simulation, puts forest production planning and monitoring on a more rational, reliable and testable basis. Its great advantage is the ease and transparency by which different functions and spatial scales can be linked and integrated. The feasibility and success of this approach is well documented (DITZER, 1999; GLAUNER, 2000; KAMMESHEIDT *et. al.*, 2001a and b; KLEINE, 1997; KOEHLER, 2000). Improvements towards greater site-specific adaptability and structural and dynamic flexibility continue to be made (BFH, 2000, p.17-18 and 100).

These results are corroborated by a fair number of forestry projects in Southeast Asia-Pacific, Africa and tropical America. Outstanding examples among them are the Demarakot Project in Sabah, Malaysia, the STREK Project in Kalimantan, the SPC/GTZ-Pacific-German Regional Forestry Project based in Fiji Islands, in Africa the exemplary policy, strategy and field practice of *Congolaise Industrielle des Bois* (CIB) cooperating closely with native communities and the Ndoki National Park, the Bambidie Concession of CEB/THANRY, and in the Brazilian Amazon Precious Wood. All these projects integrate management, conservation and protection, and put high priority on the human dimension at all levels. Other examples come from northern-temperate mixed broadleaf-coniferous and mixed coniferous forests (HUNTER, 2000). Silvicultural designs adopted in northern rainforest on Vancouver Island, BC, and in eastern Arcadian forest in Ontario (SALONIUS, 2001)

remarkably resemble systems proposed for Amazonian *terra firme* forests, and for Kerangas forests and Alan (*Shorea albida*) Peatswamp forests in Sarawak.

In contrast, the segregation concept by allocating protection functions to large tracts of forests ignores ecological basics and, even more crucially, the human dimension. Segregation offers few and uncertain benefits to the local people but, by reducing production, causes certain and substantial social costs and loss of opportunities. It raises the spectre of social and political conflicts and retards economic and social development. On the other hand, isolated and non-integrated tracts of totally protected forest areas, in reality, encourage illicit logging and NWFP collection, trespassing and illegal encroachment by people who struggle in poverty for survival, and by reckless, greedy and predatory profiteers. Therefore, the woolly concept of "high-conservation value areas" must not only be more precisely specified, but also reconsidered with a view to the balance between ecological and biological desirables and the needs, values and aspirations of local and regional communities. It is unethical, immoral and incompatible with native culture to exclude native peoples from their traditional territory, deny customary usufruct and disrupt traditional lifestyles, only to serve the aspirations of outsiders.

##### **5. Success and failure - example: what does the Sabal/Silantek/Simunjam case teach us?**

The Italian botanist Odoardo Beccari traversed the forests of the Sungai Simunjam Catchment in the Batang Lupar/ Batang Sadong triangle in 1865-8, at that time, a most astounding scientific feat and daring adventure (BECCARI, 1904, p. 137-152, 194-5, 341-350). He found a sparse population of Iban (Sebuyau Dayaks), well adapted, if not sustainable, shifting agriculture, and a largely pristine landscape of most heterogeneous, predominantly poor soils and forests in which orang-hutan (man of the woods; Malay: maias; *Pongo pygmaeus*, syn. *Simia satyrus*) were abundant.

Ninety years later, in 1954-5, in the same area, Sabal Forest Reserve (production and protection) and Silantek Protected Forest (protection) had been established, the natives had developed some trade incense and Bornean ironwood. Wildlife, including maias, was still plentiful and provided with adequate refuges in case logging would begin in Sabal F.R. At that time, Bako National Park was established as a coastal complement with orang blanda (Dutchman, *Nasais larvatus*), matching the maias in Sabal. In both areas, the local people participated and cooperated, even ceding customary rights for the benefit of protection and conservation. The Ramin Peatswamp forests between the Sabal-Silantek hills and the coast, forming an essential part of the maias territory, were put under a sustainable management system (SMS) according to LIH and LIS principles which were scrupulously implemented.

One hundred and thirty years after Beccari, in the year 1995, the situation had drastically changed. A major trunk road, along the foothills where Beccari had walked, cut right through Iban and maias territories. The forest on both sides were illegally cleared by the natives for agricultural uses which, on the poor soils, largely failed. The maias had disappeared from the hill area and were confined to the peatswamp management area and a small sanctuary on a hill near the coast. The maias had accommodated and adapted well to LIH and LIS. Management had gone through the first felling cycle of forty years. The growing stock structure and quality, and the vegetation physiognomy in the coupes ready for the second harvesting equalled that of forty years ago in the initial pristine condition.

While the integrated SMS had worked well in the Ramin Peatswamp forests, the situation was not quite as favourable in the Sabal-Silantek hills in the south. The reasons were

- the road builders and land development planners failed to provide for a balanced landscape pattern with habitat linkages for arboreal wildlife, such as the maias
- local people were not asked to participate in planning and consequently the road was nothing more than an encouragement to grab land and to encroach Sabal F.R. and Silantek P.F. to collect produce and to farm on sites which were unsuitable for farming
- low-impact harvested natural forest stands which were vigorously growing were cleared by an aid project for *Acacia mangium* and agro-forestry plantations - both failed
- a community development project conceived, eventually, with the aim of reducing pressure on land and forests, unexpectedly, had the opposite effect: it attracted relatives of the villagers who migrated from elsewhere to join the project and benefit from the wages paid for the -unsuccessful- plantation work, and to take part in the encroachment activities
- lastly, a well-connected person was issued with a timber licence; timber-mining began in Sabal F.R. around the long-term ecological research plot 146.

Instead of the originally planned integrated forestry and agricultural land development in the region, the new projects fragmented wildlife habitat, converted productive second-growth forest to unproductive scrub when plantations failed, population pressure increased, NWFP were overused, and finally timber mining penetrated into the area. The causal factors lay in the administrative and political spheres outside the forest management and conservation units and outside forestry.

## **6. Conclusion: integration or segregation, what is the real issue in tropical rainforests?**

The persistence of the claim that natural tropical rainforest can neither be regenerated nor sustainably managed for timber and, therefore, commercial forestry must be stopped or not admitted, (e.g. BARRY, 2001) stifles efforts to implement well established systems of sustainable forest management, conservation and protection. The claim that conservation of resources and the protection of nature, species and biodiversity in natural forests cannot be integrated with economically viable sustainable production of timber and non-wood forest products (NWFP), is equally persistent and damaging. Both claims belong to the realms of myths, sectarian dogma and ideological fixation and are upheld against good evidence that the underlying assumptions are scientifically untenable. However, the currently still rampant customary timber mining and NWFP resource plundering are indeed neither sustainable nor compatible with protection and conservation, but have nothing in common with forestry.

The basic question is: what sort of world, landscape and lifestyle do we want to create for ourselves, our children and our neighbours? One option is to give priority to maximising shareholder values and profits, facilitated by the opportunities offered for abuse by the globalising economy and the “free” markets which are manipulated by forces of raw and unfettered greed for money, power and fame. The blend of globalisation, unbridled financial and commodity “free” markets, driven by raw greed, unconstrained competition, uncritical and naive faith in the role of stock market values and monetary policies, contribute to the

current trend of narrowing the spectrum and diversity of traded products from agriculture, forestry and forest-based manufacturing industry in increasingly volatile markets. These processes and political failures and misdemeanours are the main sources of the fundamental causes of biodiversity loss (WRI *et al.*, 1992) and underlie the current global decline of standards and quality of life. The monotony of dreary landscapes and their products, standardised lifestyles, iniquities and social inequalities that are the result, are similarly characteristic for the countries of the “Socialist East” and the “neo-capitalistic Anglo-American West”.

The alternative option gives priority to the “human dimension”, social fairness and biological and cultural diversity, while retaining the principles of free, but socially responsible trade and globalisation. In forestry, the preferred option is integration of protection, conservation and management. Biodiversity is equally the tool and objective of silvicultural and economic management. The technical tools and knowledge for designing and implementing such integrated approaches to multi-level holistic ecosystem management have been available for some time (e.g. BRUENIG, BOSSEL *et al.*, 1987). These tools of dynamic system and risk analysis are essential for achieving sustainability of forest management, conservation and protection as part of general land use and socio-economic development. However, these tools are rarely routinely applied in practice. A major obstacle is beside intellectual inadequacy (Fig.2) the fear of administrators, shady entrepreneurs and financial and political power-holders of transparency and accountability which these tools provide. Contributing factors are “lack of interest of operators, inefficient monitoring by forest services, and lack of incentives. Larger economic and governance forces are at the root of these problems” (BLASER and DOUGLAS, 2000). These forces naturally prefer shareholder values to stakeholder interests. To overcome them and their influence on our lifestyles is the foremost task of education of formidable proportion.

But this must not discourage foresters to deploy the full strength and force of centuries of practical experience and scientific knowledge that have accrued in Central Europe. Available scientific knowledge of ecological and taxonomic diversity, and “the associated values we wish to sustain, play a major role in deciding how many different kinds of forests in the world should be managed” (KIMMINS, 1999). Sectarian dogma, hazy mythology, ideological fixation and raw greed for power, money and prestige must not afflict and distort our perceptions and convictions. Traditional forestry and forest-based industries, delivering a wide range of products and services from a diverse forest resource to a social, but free market economy and a discriminating public, have a major role to play in the struggle for sustainability of quality of all life.

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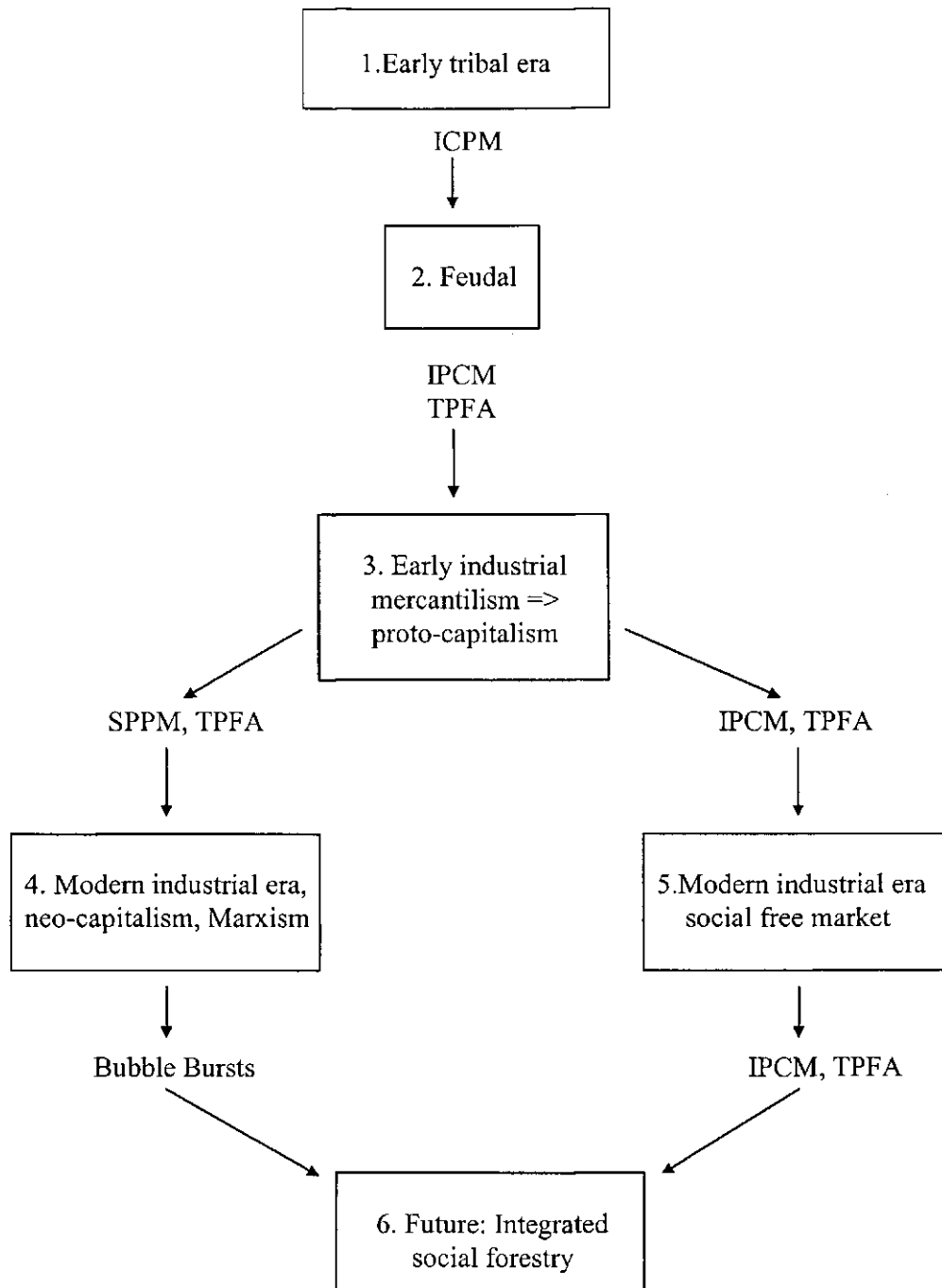


Fig.1. Simplified scheme of the progress of forestry philosophy (*Weltanschauung*) in the course of socio-economic development in Central and West-Continental Europe. ICPM = integrated protection, conservation, management; TPFA= totally protected forest area, integrated or segregated; SPPM= Spatially segregated functions of protection, conservation, management. Bubble Bursts: crashes of speculation and uncritical faith in the stock market in 1720, 1929, 2001, also chronic to catastrophic ecological, economic and social failures of tree monocultures especially in the 20th century as their spatial extend and age span increased. Era 3: 18-19th cent., the split evolves; 4. and 5. development during 20th century.

HOLISTIC AND INTEGRATED ECOSYSTEM MANAGEMENT,  
CONSERVATION & PROTECTION REQUIRE FOREMOST:

CREATIVE FANTASY

INTUITION & IMAGINATION

ANALYTICAL AND INTEGRATIVE MIND-SET

CAPABILITY OF COMPLEX & DYNAMIC THINKING

SELF-CRITICAL CONFIDENCE IN THE FACE OF RISKS  
AND UNCERTAINTIES

IMMUNITY AGAINST INTELLECTUAL ENCAPSULATION

EMPATHIC MIND TO HANDLE THE HUMAN DIMENSION

IDEALISTIC MOTIVATION AND REALISTIC GOALS & ASPIRATIONS

SELF-DISCIPLINE, SENSE OF RESPONSIBILITY AND TRUTHFULNESS

RATIONAL AND REALISTIC EXPECTATION, ADAPTABILITY, PERSISTENCE

UNDERSTANDING CHECKS, CHANGES AND BALANCES IN NATURAL AND  
CULTURAL (ECONOMIC, SOCIAL, POLITICAL) ECOSYSTEMS

Fig. 2. Forests, forestry, natural environment, economy, society and politics are fuzzily performing, complex, open and dynamic ecosystems. Individual processes may be linear and bio-cybernetically regulated, but the ecosystems as a whole and their compartments, sectors and process complexes, are not. The only reliable and all-pervading constant is change. Ecosystem management, protection and conservation at all levels must cope with high risks, uncertainties and severely limited predictability under extremely complex and dynamic conditions. Ecosystem management must be solidly based on scientific knowledge and practical experience, but requires much wider intellectual and moral qualities, and high levels of social sensitivity and managerial capability and expertise.