



Why and how to measure forest governance at local level: A set of indicators[☆]



Laura Secco^{*,1}, Riccardo Da Re, Davide Matteo Pettenella, Paola Gatto

Department of Land, Environment, Agriculture and Forestry (TESAF – Territorio e Sistemi Agro-Forestali Department), University of Padua, Viale dell'Università 16 – AGRIPOLIS, 35020 Legnaro, Padova, Italy

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ABSTRACT

The methodologies and operational instruments for the assessment of forest governance are still under development. While there are some advanced initiatives focused on forest governance assessment at international/national scale, there are relatively few at local level. However, assessments of local forest governance would be useful for both policy-makers and practitioners. The paper presents and discusses an original set of indicators to measure the quality of forest governance at local administrative/spatial level and the method used to develop them. A draft list of indicators (mainly process-oriented) has been formulated with respect to seven governance key-dimensions (sustainability, efficiency, effectiveness, participation, transparency, accountability and capacity). This draft list has been tested in two pilot applications (data collection by means of questionnaires). The indicators, which include both dichotomous and continuous variables, can be standardized in a few composite indicators to provide concise information about governance performance. Despite some methodological limitations that need to be further explored, the final set of 78 indicators appears to be a simple and practicable assessment tool, that can be used either for external or internal evaluations. Additional tests are needed to consolidate the tool.

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1. Introduction

Forestry, like other sectors dealing with natural resources management (e.g. Bodin and Crona, 2009; Beunen and Opdam, 2011), is stimulated by the debate on new forms of governance, i.e. on new ways for mutual interactions of public and private actors in taking and implementing policy decisions regarding collective problems (see e.g. Kjaer, 2004; Arts and van Tatenhove, 2006; Kleinschmit et al., 2009; UNDP, 2009; Hufty, 2010; Broekhoven et al., 2012). In the last 10–15 years, innovative forest governance modes – focused on decentralization, market-related tools and participatory approaches – have been introduced at various levels, from international to local, with the aim of promoting the sustainable management of forests in a globally changing scenario (Buttoud, 2006; Arts and Visseren-Hamakers, 2012; Høgl and Pülzl, 2013). These new types of forest governance, which are confronting an increasing number of new or persistent forest challenges,² are

typically multi-actor, multi-sector and multi-level (Lemos and Agrawal, 2006; Rametsteiner, 2009). These three characteristics are the result of interactions, relationships and networks that involve power relations, negotiations and decisions among respectively: i) the multitude of forest actors/stakeholders; ii) different sectors of economy and society; and iii) international, national and local levels (e.g. Arts and van Tatenhove, 2006; UNDP, 2009; Andonova and Mitchell, 2010; Buizer et al., 2011).

In the field of public policy and institutional analysis, the multi-level³ category of governance is assuming special relevance (Cash et al., 2006; Howlett et al., 2010) due to a number of factors. First of all, the increasing difficulties (see the UNFF, the post-Kyoto and Rio + 20 negotiations) or even failures of international efforts to develop a binding global forest regime and the consequent increasing attention placed by many international organizations and government agencies on fostering regional, national and local forest institutions and processes in many countries in order to promote their own, domestic good forest governance (Cashore et al., 2010; Howlett et al., 2010). Secondly, the increasing implementation of the principle of subsidiarity by means of decentralization processes (Marshall, 2008; Arts and Visseren-Hamakers, 2012; Howlett et al., 2010; Berkes, 2010), which are considered – if associated

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* Corresponding author. Tel.: +39 0498272692; fax: +39 0498272772.

E-mail addresses: laura.secco@unipd.it (L. Secco), riccardo.dare@unipd.it (R. Da Re), davide.pettenella@unipd.it (D.M. Pettenella), paola.gatto@unipd.it (P. Gatto).

¹ Skype: laura.secco.

² The economic, social and environmental importance of forests, and consequently the forest agenda, are changing (Høgl and Pülzl, 2013). New or persistent challenges are governance and policy reforms, poverty alleviation, forest degradation, illegal logging, water cycle regulation, biodiversity protection, carbon sequestration, etc. As an example, see the Governance Research Agenda for FLEGT (EFI/Tropenbos International, 2013).

³ The concept was initially introduced in the EU context to refer to the multi-level character of both European institutions and EU member states (Arts and Visseren-Hamakers, 2012; EC, 2001; Kjaer, 2004). Later, it was used to show interconnections between domestic and international politics.

to appropriately designed local institutions (Ostrom, 1990) – proper mechanisms “to promote fair and just allocation of forest rights and resources for forest dependent communities and indigenous peoples” (Cashore et al., 2010 – p. 451). Thirdly, the changing role of public forest agencies that are facing a “de-institutionalization” process (Veenman et al., 2009). On the one hand, public forest agencies are expanding their mandate from solely forest management to more complex concerns and functions that imply capacity of “interactions with a wide range of stakeholders and interests” at all levels, and on the other, they are facing “institutional erosion” due to “growing financial limitations, a process of downsizing, and a loss of presence in the field” (Pacheco and Kaimowitz, 1998 – cit. in Cashore et al., 2010 – p. 471). In order to react to these dynamics, national State forest institutions in many European countries, for example, are reforming themselves in order to increase their profit making without losing their capacity to manage forests for multiple uses in the interests of the whole society, while giving proper assurances of economic effectiveness and efficiency (Krott and Stevanov, 2008).

In a governance network (e.g. Jordan and Schout, 2006) public forestry administrations are only one type of stakeholder that play a key-role, for example, in designing and implementing National Forest Programs, which are recognized “as an important procedural framework for promoting good forest governance and, thus, sustainable forest management” (Sepp and Mann, 2012 – p. 184). Indeed, forest institutions have to adapt to the changing social and political scenarios by adopting strategies and interventions for networking, mediating and coordinating new sets of interactions (see e.g. Poteete and Ostrom, 2004; Cashore et al., 2010). If there is a lack of coordination between forest institutions and other actors, and in particular if multi-level governance is not properly arranged, public forest institutions are likely to become the “weak link” in the forest policy chain, regardless of whether they operate at a local or national level (Howlett et al., 2010).

The weakening of such institutions and the increasing number and variety of interactions needed among forest stakeholders to face the new or persistent social, economic and environmental challenges, together with the complex nature of new policy tools⁴ are contributing to a growing attention towards the topic of good governance. It is widely accepted that this concept, which primarily refers to the integrity of institutions and enforcement of rules that govern the forest sector, is nowadays informed by a number of basic general principles such as participation, transparency, accountability, efficiency etc. (e.g. Cashore, 2009a, 2009b; Rametsteiner, 2009; PROFOR/FAO, 2011). Opting for such good governance principles is a challenging task for public, private or mixed organizations at every level, from global to local.

Therefore, instruments to measure genuine good governance performance, which might contribute towards the adoption of new approaches and provide information in support of public policy decisions, are becoming priorities in the forest policy agenda. They include methodologies and operational instruments to assess forest governance quality, which are commonly based on a systematic evaluation of (mainly) national institutions' performance. But local governance assessments are also likely to have significant applications in forestry, as in other sectors, since they can be used to inform policy (at both local and national levels), build capacity and empower the community (UNDP, 2009). There is an increasing requirement for such methodologies: i) to reflect the current societal demands (e.g. transparency, participation, environmental and social responsibility); ii) to measure the concrete effects of changes on natural resources and human well-being; iii) to concisely and clearly communicate the quality of governance to policy-makers.

A number of initiatives to develop methodologies and operational instruments to assess forest governance are currently under development, but while there are some advanced initiatives focused on forest

governance assessment at an international and national scale (Hyden et al., 2008; Saunders and Reeve, 2010; Secco et al., 2011; Maidell et al., 2012), there are few at a local level. In particular, 22 assessment tools for local (decentralized) governance measurement have been collected and cataloged by UNDP (2009), but none of them is specifically focused on the forest sector.

All the existing methodologies, either at an international/national or local level, are based on sets of indicators, even if their approaches and objectives may differ significantly. Some of them are comprehensive governance assessment methodologies based on multiple stakeholders' perspectives, others are specific governance assessments based on single stakeholder's perspectives (such as citizens), and others are self-assessments carried out by local government institutions to measure their own performance (Hyden et al., 2008; UNDP, 2009). Given that no well-consolidated systems yet exist of simple, practicable and actionable indicators for measuring forest governance at a local level, and given the importance of monitoring and evaluation for implementing emerging complex policy instruments (such as PES and REDD+) (e.g. Saunders and Reeve, 2010; Pettenella and Broto, 2012), this paper presents the method and indicators we have developed for assessing the quality of forest governance at the spatial and administrative level where abstract policy goals are implemented in practice by means of projects and management choices (i.e. the local level).

The theoretical background of our research is presented first (Section 2). We start from the growing relevance assigned to the good governance concept and then move to the potential usefulness of assessment methods applied to forest governance in orienting forest policy reforms. As part of the theoretical background, we also briefly discuss the issue of scale, which is connected with multi-level governance and its arrangements, as well as with each single governance level from global to local. This issue is analyzed with respect to some of the methodological challenges of assessments. On the basis of these considerations, we then state the research problem (Section 3) and explain in detail the method used to develop our set of indicators (Section 4). The last part of the paper (Section 5), lists the set of proposed indicators, which have been tested in two pilot applications. The discussion focuses on methodological challenges, e.g. unsolved limitations, possible future advances and necessary improvements of our method and indicators, with respect to the current forest policy and governance debate.

2. Conceptual framework

Below, we describe the reasons at the basis of our proposal: first of all, we explain why we need assessment of forest governance and what we mean by good governance in the context of our paper; secondly, we clarify why scale matters in forest governance assessment.

2.1. Why we need assessment of forest governance

The governance concept is far from being sufficiently clarified and is “just as contested as sustainable development” (Arts and Buizer, 2009). In the forest policy domain, the concept of good governance basically refers to “the integrity of institutions and processes that govern forests in their countries” (GFI, 2009 – p. 1) and it is linked with the promotion of policy and institutional reforms in accordance with a number of basic principles (GFI, 2009; WB-ARD, 2009; Arts and Visseren-Hamakers, 2012). Even if good governance⁵ has different contents and meanings depending on historical, institutional and cultural contexts, its basic principles are very similar world-wide: effectiveness, efficiency,

⁵ In the economic development domain, good governance is mainly conceptualized as “the standards adopted by Western liberal democracies” (e.g. Hyden et al., 2008 – p. 9) and often criticized (e.g. Nanda, 2006); in this case, its basic principles are typically used at global, regional and national levels for comparative analytical purposes (e.g. for country rankings and donors informing about investments' stability and expected economic growth).

⁴ Based on public-private partnerships, public-social partnerships and/or co-management (Lemos and Agrawal, 2006) such as Payments for Ecosystem Services, REDD + projects, Community-based Forest Management, etc.

coherence and appropriateness, transparency, accountability, legitimacy, law enforcement, lack of corruption, stability, public participation, empowerment, coordination, social justice, equity, environmental and social sustainability of impacts (EC, 2001; ODI, 2007; Kaufmann et al., 2010; Cashore, 2009a, 2009b; GFI, 2009; WB-ARD, 2009; Rametsteiner, 2009; PROFOR/FAO, 2011), with some variations.

The problem of defining good governance is quite similar to the one faced in developing the concept of sustainable forest management (SFM). In the past, the key-questions on SFM were: “What is SFM – in tropical forests or in a certain country? Who has the right to define it?”. Similarly, the key-questions for governance are: “What is GG – in Europe or in a certain country? Who has the right to define it?”. In this sense, the SFM policy learning process is supporting a positive progressive incremental change in society, politics and institutions (Rayner, 2010), which is inducing a growing demand for good quality of governance performances.

As mentioned previously, the introduction of new policy tools and the changing social and political scenarios require innovative institutional configurations and capacities (Cashore et al., 2010) based on the ability of institutions to adapt themselves, mediate and coordinate interactions at various spatial, temporal and administrative scales (Buizer et al., 2011; Broekhoven et al., 2012; Cash et al., 2006; Howlett et al., 2010; Potete and Ostrom, 2004). In other words, all public and private forestry actors (both as individuals and as formal/informal, horizontal or vertical networks) are challenged by the call to opt for good forest governance principles.

With respect to the above-mentioned considerations, we make three assumptions. First of all, even if the basic good governance principles are not universally accepted and have so far been typically used for referring to global, regional or country levels of forest governance arrangements, we argue that the most common ones can (and should) be also used as guiding ideas for governance arrangements at single lower levels (sub-national, local), as well as for the multi-level governance system as a whole, with its multiple interlinks among institutions and levels (Young, 2002). For example, enhancing multi-level governance arrangements is identified as a promising strategy to overcome global forest regime fragmentation (Howlett et al., 2010), i.e. to increase the global forest governance, but for such a strategy to be effective many typical aspects of good governance principles (e.g. adoption of coordination, accountability procedures, transparent decision-making processes, etc.) would be needed to develop new multi-level arrangements.

Our second assumption is that the concept of good governance can also be interpreted in a less strictly regulatory meaning – for example, with respect to its application in economic cooperation for development. Forest institutions and policy reforms can continuously improve their performances through being inspired/informed by the most common good governance principles (participation, accountability, transparency, etc.) starting from baseline and measuring changes over time in order to assess whether they are (or not) progressing towards a better quality of governance arrangements and related outcomes. By adopting an institutional perspective within a Governance Capacity Approach (GCA), this concept refers both to the “indicative governance capacity” and “performative governance capacity” (Arts and Goverde, 2006). In the first type of governance capacity, “the key question is whether a certain policy arrangement is such that we can expect a “capacity to govern”. This means that there are enough resources available, that the key policy actors are involved, that the rules of the game do not prohibit appropriate (change) behavior, etc.” (Arts and Goverde, 2006 – p. 80). Such a governance capacity can be assessed on the basis of the notion of “congruence”⁶ assuming that “a certain level of congruence – respectively among the policy views of different

actors, among the dimensions of policy arrangements and available resources and rules, and among a policy arrangement and its wider institutional context – is needed for any policy arrangement to perform (and, in contrast, a lack of congruence implies governance failure): [...] the more congruence, the more (potential) governance capacity” (Arts and Goverde, 2006 – p. 80 and 81). While the institutional capacity can be assessed on the basis of congruence of a policy arrangement, the “performative governance capacity” can be assessed on the basis of the capacity of policy arrangements to balance among jurisdictional, economic-managerial and political-civic principles of good governance that reflect perceptions, needs and strategies of policy actors (Nelissen, 2002). The two types (indicative and performative) of governance capacities are clearly interlinked.

Our third assumption is that proper judgment tools are needed in order to assess the quality of governance implemented by any forest organization, either private, public or mixed, at any level. Some of them can be taken from instruments or procedures initially developed and implemented by international and regional organizations for economic development,⁷ which have also later been applied to the environmental sector (e.g. Birnbaum and Mickwitz, 2009). An evaluation is based on a systematic and objective assessment of an ongoing or completed policy, program or project, included in its conception, formulation, implementation and results (EC, 2004). These analytical assessments emphasize “reliability and usefulness of findings. Their role is to improve information and reduce uncertainty” (OECD, 1999 – p. 6). They aim to determine the relevance and fulfillment of objectives, development efficiency, effectiveness, impact and sustainability (e.g. Morra-Imas and Rist, 2009; OECD, 2010, 2012). In evaluation practices, common guiding principles are impartiality and independence of the assessment, credibility, utility, programming, dissemination and feedback of the lessons learned (OECD, 2012). Many types of evaluation are used depending on the assessment scope, its objectives, actors and time, for example external or internal, and/or ex ante, mid-term (in itinere) or ex post.⁸ The intention of evaluations of projects or policies is to identify the factors of success or failure, to assess the sustainability of results and long-term impacts, and to draw conclusions that may inform other interventions. It is therefore widely accepted that an evaluation is likely to provide credible and useful information for better orienting decision-making, learning from the past and thus improving the governance in the future (e.g. Cashore, 2009b; OECD, 2010). The procedural-oriented⁹ assessment approach based on process-oriented indicators (Williams, 2011) is preferred, focusing on how the process is organized and implemented, assuming that a “good” (i.e. inclusive, transparent, legitimate, etc.) decision-making process may be instrumental to an effective/successful later phase of policy implementation, and thus contributes to guaranteeing the overall good governance (Wesseling and Paavola, 2008; Dwyer and Blandford, 2011).

2.2. Why scale matters in forest governance assessment

Scale issues underpin analysis and research in many fields – environmental sciences, ecological economics, geography, social sciences, political sciences, etc. (e.g. Gibson et al., 2000; Cash et al., 2006;

⁷ E.g. the Organization for Economic Cooperation and Development, World Bank, European Commission, Overseas Development Institute, etc.

⁸ An external evaluation of an intervention (e.g. a development project) is conducted by entities and/or individuals outside the donor and implementing organizations. An internal evaluation is conducted by a unit and/or individuals involved in the intervention reporting to the management of the donor, partner, or implementing organizations (a related term is self-evaluation). By referring to the Project Cycle approach, an ex-ante evaluation is performed before the implementation of an intervention; a mid-term evaluation (in itinere) is performed towards the middle of the period of implementation of the intervention and an ex-post evaluation is performed after the intervention has been completed. The latter may be undertaken immediately after or long after completion (OECD, 2010).

⁹ With respect to the widely accepted outcome-oriented assessment approach, where the decision-making process or governance mode are evaluated with regard to their short-term outputs.

⁶ Important characteristics of congruence concept, as introduced by Arts and Goverde (2006 – p. 81), are that congruence is dynamic, i.e. it “changes with people’s preferences, institutions and structural processes”; it “does not mean full consensus or full consistency” and it allows “agents to reflect upon and change institutions”.

Birnbaum and Mickwitz, 2009; Buizer et al., 2011). A “scale” can be described as “the spatial, temporal, quantitative, or analytical dimensions used to measure and study any phenomenon” (Gibson et al., 2000 – p. 218), and “levels” as units of analysis that are located at the same position on a scale (Gibson et al., 2000 – p. 271). There are many types of scales: ecological, spatial, temporal, administrative/jurisdictional, institutional, networks, etc. (Cash et al., 2006). Some are typically vertical scales (e.g. institutional), others are horizontal (e.g. spatial) (Young, 2002), and yet others are mixed (e.g. multi-layer networks).

The problem of scales clearly applies to forest policy and governance analysis (e.g. Arts and Buizer, 2009; Howlett et al., 2010; Buizer et al., 2011). In the forest sector, vertical and horizontal institutional intersections can be summarized in Fig. 1.

The policy-making process is divided into two main parts by a dotted horizontal line: in the upper part (which can be split in other two sub-parts), policy ideas are conceived and formulated as “abstract” ideas, general goals (or principles) and related, more precise objectives (or criteria); in the lower part, these policy ideas are achieved through concrete actions and projects, which are to fulfill specific requirements. As pointed out by Cashore et al. (2010 – p. 443), in fact, policy contents move from a high level of abstraction, to program level operationalization, and to specific “on the ground” measures. Through the implementation of decentralization and subsidiarity principles and other instruments, global forest governance has been (and still is) “rescaled away from the nation-state in multiple directions: vertically down towards lower government levels, i.e. provincial and municipal governments” (Andonova and Mitchell, 2010 – p. 255). Policy-decision levels vary widely country by country, depending on the level of administrative decentralization, but always along a vertical, institutional (or administrative) scale. International forest regimes influence national forest policies and programs (e.g. Pülz and Rametsteiner, 2002; Howlett et al., 2010), which in turn have impacts on sub-national forest policies and programs. International and regional institutions increasingly rely on domestic or local institutions to implement their general principles of sustainability and good forest governance, which otherwise often remain too vague. Overall abstract forest policy goals that are formulated in international non-binding agreements have to be “translated” into more concrete objectives and precise

specifications to be effectively applied in the field at the forest site level. Thus, all the higher levels directly or indirectly influence the lower local level, where policies designed at higher levels are implemented in practice by means of “on the ground” measures set up by groups of actors. One of the problems related to policy downscaling is that some global forest governance institutions lack the authority (and legitimacy) to determine concrete effects and behavioral change at the local level (Cashore et al., 2010).

While global and regional agreements are supposed to have impacts on local practices and behavior of local actors, local public authorities and private actors are considered able to affect global and regional politics (e.g. Berkes, 2008; Arts et al., 2009). Local actors (public organizations, private enterprises, NGOs, etc.), which have different nature, size, location, management objectives, etc. (graphically represented in Fig. 1 by various shapes: triangles, circles, etc.), can collaborate (or not) in implementing specific projects for rural development or participate in specific management measures for forest conservation. Their (possible) collaboration is represented by means of a network (the links among small shapes in Fig. 1). These groups of actors can sometimes be identifiable as communities (or networked socio-ecological ecosystems), within a defined geographic or administrative boundary (represented by the large oval around the actors’ network); they can be characterized by various levels of heterogeneity and size (Poteete and Ostrom, 2004), and/or they can implement forest-based projects at macro, meso, or micro levels along spatial scales (Gibson et al., 2000). While international forest regimes and national forest programs influence the local level (top down, left arrow in Fig. 1), the local community and/or group of actors collaborating in a site-specific project should provide feedback (bottom up, right arrow in Fig. 1) on the best operational solutions and policy effectiveness, as well as possible changes needed at the higher policy-decision levels (e.g. Ostrom, 1990; Marshall, 2008; Cashore et al., 2010). When forest “governance [is] vertically up rescaled towards supranational regimes” (Andonova and Mitchell, 2010 – p. 255), two aspects have to be taken into consideration. The first (political) is the fact that the nation-state “does not have sufficient capacity” by itself as a single institution “to address the complex, multi-scale and spatially variable challenges in sustaining forests” or in dealing with other global concerns (Broekhoven et al., 2012 – p. ix), because forest

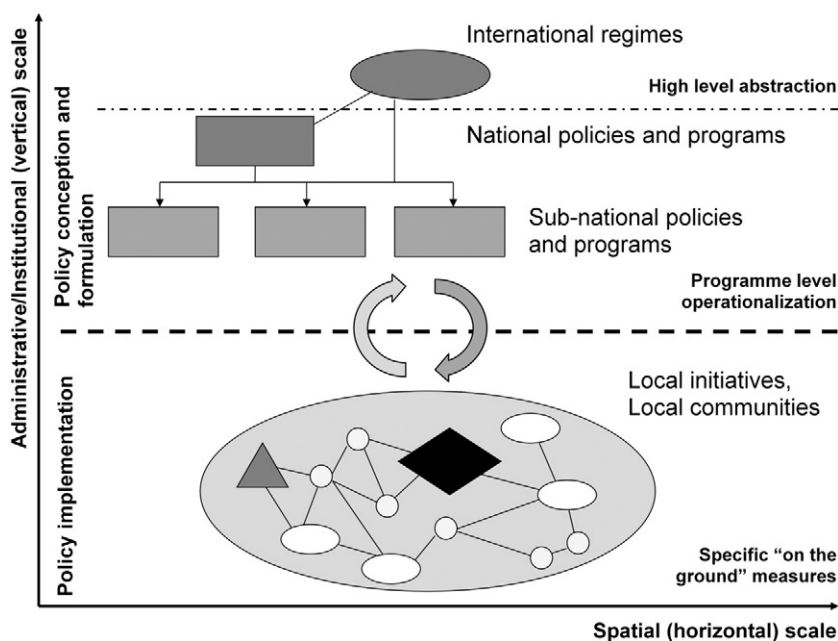


Fig. 1. Forest governance vertical and horizontal scaling. Legend: Higher oval: International forest agencies and institutions; Rectangles: State-agencies, Governments; Lower oval: geographic and/or administrative boundary to identify a community and/or territory; Various shapes in the lower oval: forestry actors; Links between shapes: collaboration and exchange of information flows (network). Source: our elaboration, mod. from Andonova and Mitchell, 2010, integrated with ideas from Cashore et al., 2010.

ecosystems and forest products flows have no boundaries. The second (technical) aspect is the fact that some requirements are very site-specific, and can neither be defined nor implemented at levels higher than the local one.

Vertical rescaling processes involve the shifting or linking of political action across geographical space or jurisdictions from the global to the local level and vice versa (Rayner, 2010; Andonova and Mitchell, 2010), but the scaling patterns can vary (not only up or down, but also double, recursive, etc.) (Amin, 2002). A “double loop” in forest policy downscaling and upscaling processes is evident in the case of REDD initiatives, used here as an example to describe the loop. The UNCCC and the KP, i.e. the international climate regime, on the basis of the debate within the scientific community, generated new ideas about forest policy goals, nurturing the discussion on the role of deforestation and forest degradation in global climate change and downscaling the issue to regional, national and local community levels. The abstract ideas first contributed to developing civil society initiatives (i.e. deforestation avoidance investments in the voluntary market launched in 2003 by the Chicago Climate Exchange system), which the REDD concept initially started from. Only later, the REDD concept – as a feedback about possible “on the ground” measures to implement global ideas for climate change mitigation – was transferred to the international institutional dimension and discussed at the 11th KP COP in December 2005 (UNFCCC, 2012). After the global community's general agreement on the instrument choice, the international institutions decided to rely on more authoritative domestic institutions (with national governments developing a REDD National Strategy) and local actors to apply specific policy measures, with site-specific REDD+ projects following certain standards and requirements (Pettenella and Brotto, 2012) and with local adaptation practices (e.g. Agrawal and Perrin, 2008). As noted by Seymour 2008 and the Rights and Resources Initiative 2009 (quoted in Cashore et al., 2010), “whether and how a (global) climate regime can help forest managers adapt to new challenges will depend on the interaction of neo-liberal norms – which may favor transnational firms and are defined at international/national level – with the norms of indigenous community participation and poverty alleviation in shaping the development of specific policy measures” (p. 445). Similar patterns of scaling among the various policy-making levels can be described for forest certification and many other (new) policy instruments (Lacey Act, Forest Law Enforcement Governance Trade – FLEGT Action Plan, Voluntary Partner Agreements – VPAs, European Union Timber Regulation – EUTR).

Decisions taken at one level have intended or unintended effects at other levels, while decisions on the same issue taken at all levels might combine (often in unexpected ways) (Bodin and Crona, 2009), thus generating different effects on different levels. These concepts are reported as “constitutive hierarchy” or “nested hierarchy”, typical of complex systems such as governance systems¹⁰ (e.g. Gibson et al., 2000; Marshall, 2008), where “the lower level can combine into new units that have new organizations, functions and emergent properties”, thus adopting new, collective behaviors (Gibson et al., 2000 – p. 221; Berkes, 2008; Bodin and Crona, 2009). Thus, either a multi-level perspective should be used to examine global change processes or the governance mechanisms that occur at the lower administrative/spatial levels should be better explored due to their potential to influence the higher levels.

As shown in Fig. 1, human social systems address forest challenges at global, national and local levels with nested systems of forest governance institutions, which should be able to address the vertical and horizontal interplay across scales, actors and processes of governance

(e.g. Young, 2002; Andonova and Mitchell, 2010; Arts and Visseren-Hamakers, 2012).

The quality of global forest governance is therefore significantly affected by the quality of both vertical and horizontal interactions, for example in terms of coordination (one of the key elements of good governance). If a better coordination in policy-making processes is guaranteed among policy and institutional levels (vertical scaling) and within the same level – including the lower one – along administrative/jurisdictional, institutional and spatial scales (horizontal scaling), the risk of policy failures is reduced, i.e. the outcomes of the fragmented and disorganized global forest regime can be improved (Saunders and Reeve, 2010; Howlett et al., 2010; Buizer et al., 2011). These ideas are coherent with both the concept of indicative governance capacity, based on the notion of “congruence”, and performative governance capacity, based on the performances of policy actors (public and private) in processes, plans and outcomes, introduced by Arts and Goverde (2006). As upgrading a fragmented governance architecture by means of incremental elements from a national/regional to global level is considered a promising strategy for improving the global forest regime (Howlett et al., 2010 – p. 93; see also Berkes, 2008), as an alternative to the top-down regime based on agreements, we can assume that upgrading fragmented but good quality local governance initiatives might also contribute to the improvement of the intermediate levels (regional or national) of forest regimes.

In this paper, depending on the scale (administrative/institutional or spatial), we refer to “local” as the lowest tier of forest administration within a given state (e.g. region, province, county, district, municipality, etc.) and/or as the smallest area at which a forest project or program can be implemented by involving various actors (e.g. park, valley, mountainous area, community-based managed area, etc.). Even if forest policies are often implemented by local governments or agencies with well-defined administrative and functional boundaries, territories and scales are produced socially (Amin, 2002) and boundaries of local governance arrangements can be flexible and transform over time together with changes in local actors' networks (Bodin and Crona, 2009).

This conceptual framework introduces our argumentations for the need of indicators of forest governance at a local level. As we explain in the following paragraph, this is due to the fact that existing methodologies for forest governance assessment focus on levels higher than the local one.

3. State-of-the-art

3.1. Existing forest governance assessment methodologies

Assuming that “governance [...] operates at every level of human enterprise, be it the household, village, municipality, nation, region or globe” (UNDP, 2006), the choice of the more appropriate scale-level (Gibson et al., 2000) and/or a multi-level approach analysis are key-aspects to be taken into consideration when developing instruments to assess the quality of governance (Rametsteiner, 2009). In forest governance assessment, at least two scenarios can be identified referring to scales: one referring to larger scales (global, regional or national) and one to smaller scales (sub-national or local) (Amin, 2002). At a “large” spatial and/or institutional scale (i.e. at global, regional or national level), considerable efforts have been made to develop criteria and indicators for analyzing forest policies (and related governance) issues. Systems like the MCFPE set of C&I or the FLEGT Barometer can now be considered quite well developed. Key-examples (of paramount importance) of such initiatives with the main specific purpose of assessing good forest governance at a national level are the Forest Governance Diagnostics Tool developed by the Agriculture and Rural Development Department of the World Bank (WB-ARD, 2009) and the Governance of Forests Toolkit of the World Resource Institute (GFI, 2009). Recently, a team of experts led by the FAO and the Program on Forests (PROFOR) of the World Bank have developed a comprehensive Framework for

¹⁰ Howlett et al. (2010, p. 100) for example describe the “nested form” of the “global forest governance architecture”.

Assessing and Monitoring Forest Governance (PROFOR/FAO, 2011), which is also intended to be applied in a country's forest sector. PROFOR has also finalized a users' guide to its diagnostic tool for assessing and monitoring forest governance (Kishor and Rosenbaum, 2012). The guide builds on the FAO-PROFOR Framework on Forest Governance and includes 130 indicator questions that can be used, relatively quickly and affordably, to establish a baseline of the quality of forest governance at the country level. This approach has so far been tested, with World Bank support, in Uganda, Burkina Faso and Russia. Based on official statistics and other secondary sources, they benefit from good data availability and pilot applications underway not only in developing countries (which however remain the main target), but have major shortcomings in their descriptive nature (e.g. mainly for ex-post assessment of policy effects on forest resources) and complexity (e.g. some of them include more than 100 qualitative indicators and are based on broad experts consultations throughout the country). Other weaknesses are that innovative dimensions of multi-level, multi-sector, multi-actor governance (e.g. organizational models for implementing public participation or assuring transparency) are marginal and some of them focus on specific concerns (economic development; illegal logging and related policies as FLEGT; climate change and REDD+, etc.).

At a "small", local spatial and/or institutional scale (i.e. sub-national and local level), the need to evaluate projects and actions – often undertaken and managed by local agents such as local governments – has led to the development of sets of performance-based indicators (e.g. SFM C&I for certification) that are very site-/context-specific, more detached from secondary data and based on direct survey (costs). Local governance performance typically and mainly refers to outputs or results achieved by local governments in service delivery, income and efficacy of public expenditure, also including measures of the institutional, financial and human resource capacities to develop, implement and monitor/evaluate their policies and programs. Despite 22 tools for assessing/measuring local governance having been cataloged by UNDP (2009), a limited number of concrete assessments have been carried out to date. Consequently, robust, comprehensive and tested methodologies for both national and local natural resources/forest governance assessment are lacking (UNDP, 2009 – p. 27). Apart from consolidated experiences in forest certification (where indicators on participation, transparency, accountability are required), these sets of indicators usually lack considerations on governance key-components like distributional effects (equity), stakeholders inclusion (participation), etc.

3.2. Why we need indicators of forest governance at local level

Indicators are quantitative or qualitative variables or factors that can be used to concisely describe, understand, monitor and assess complex phenomena/systems (e.g. governance). Local indicators might be necessary to define a baseline in the quality of local governance, improve local governments'/institutions' performances in governing forestry, as a local diagnostic tool to identify weaknesses and strengths in local forest governance mechanisms or as feedback on effectiveness of global/national policy implementation at a local level.

Various classifications of indicators exist (Bezzi et al., 2009; Franceschetti, 1982; Lammerts van Bueren and Blom, 1997; UNDP, 2009).¹¹ One that is functional to governance analysis is proposed by

¹¹ Franceschetti (1982): final indicators (subdivided in result and objective indicators), intervention indicators (subdivided in instrumental and activity indicators), commitment indicators (subdivided in restriction and tendency indicators), and contributory indicators. Lammerts van Bueren and Blom (1997): Input/Process/Outcome; Quantitative/Qualitative indicators. UNDP (2009): Input, Process, Output, Perception, Outcome and impact indicators. Bezzi et al. (2009): context, process, output, outcome and impact indicators.

Williams (2011): indicators can be distinguished according to source and objectivity (fact-based indicators, expert judgments, survey on public perception), level of impact (input, process, output or outcome-oriented indicators), comparability (cross-country comparability, comparability over time, country-specific indicators) and degree of aggregation (disaggregated indicators, measurement of a single aspect of governance, composite indicators). Together with the quantitative/qualitative nature of assessment, the subjectivity/objectivity issue is "one of the most heated debates among users and producers of governance indicators" (Kaufmann and Kraay, 2007 - p. 3). Objective data are commonly based on official statistics and/or standards, laws, treaties, and various other types of official documents. Their major drawback is their (often) poor quality (for example in developing countries) and (sometimes) limited availability. Nevertheless, they are highly desirable because of their reproducibility, even if they might not always be available for all governance criteria, particularly for process-related ones at a local level; moreover, being "fact-based", they are more difficult to dismiss than "mere opinions". Subjective data rely on people's perceptions. They are usually gathered through polls or surveys of residents by means of questionnaires, interviews with experts or similar complex methods. One of the biggest limitation of perceptions is that they "are founded upon events which people remember" (UNDP, 2009 – p. 8), about which they have not always have fact-based information. Nevertheless, they are commonly accepted because "all firms and individuals take actions based on their perceptions", and "it is difficult to come up with alternatives to perceptions data" (Kaufmann and Kraay, 2007 – p. 3; Court et al., 2002; Kaufmann et al., 2010). In addition, it is recognized that "even evaluations based on rigorous methods rely significantly on judgment" (OECD, 1999 - p. 6).

Existing sets of forest governance indicators for global/national assessments are based on various combinations of quantitative/qualitative and fact/perception-based measures of governance (as classified e.g. by Williams, 2011 or Kaufmann et al., 2010). None of them entirely fit into local governance assessment applications, for two main reasons. Firstly, the majority of fact-based indicators are based on ready/usable secondary data that are available only at a country level (national statistics): reliable secondary data are rarely available at a local level. Secondly, most of them are based on national experts' consultations, which might be quite complex and costly data collection processes (Hyden et al., 2008). Three additional limitations to the use of global/national level indicators are that: i) most of them are formulated for asking national experts rather than local actors perceptions, with a consequent use of complex concepts, technical words and issues that are meaningful only at the country level (and thus risks of potential bias if the same interview is carried out at a local level); ii) they can scarcely explore/describe site-specific conditions and phenomena, which are particularly needed in the implementation of certain types of policy instruments at a local level, such as Payments for Water (or other ecosystems) Services; iii) in some cases, the existing forest governance assessment initiatives provide guidance for developing indicators rather than ready, properly formulated indicators (leaving this task and related responsibility to assessors), with the consequent pros and cons. Due to the above-mentioned methodological limitations to the use of existing sets of indicators for global, regional or country governance assessments; and because of the scope of existing indicators for local governance assessments, which are often not intended for natural resources management, we believe that indicators should be developed for assessing the quality of governance, specific to the forest sector and local level. Our paper is intended to provide a first contribution in this direction.

4. Methodology

Below, we describe the method that has been applied to develop our set of indicators, starting from possible dimensions of good governance. Our conceptual framework is based on seven key-dimensions, which we found in the literature being considered as

particularly relevant to the new governance modes: 1) Sustainable glocal¹² development, 2) Efficiency, 3) Effectiveness, 4) Participation, 5) Transparency, 6) Accountability and 7) Capacity. For each of these key-dimensions, a number of key-sub-dimensions have been identified, by means, among others, of a literature review and Mind Maps. The identification of the seven key-dimensions was functional to the sub-division of the general key concepts of governance into more clear, detailed and precise sub-components for each concept/dimension. This sub-division helped us to identify possible usable indicators, while trying to avoid overlapping, redundancies and repetitions. Our conceptual framework, as well as a first tentative list of indicators – at that time still under development and testing – have already been introduced to the international debate on forest governance (Secco et al., 2011). The one reported here (Fig. 2) is a revised, improved version that takes the results of pilot applications into consideration.

In order to formulate the final list of indicators, we followed three main steps, based on: 1) scaling-down from international/national assessments' valuable indicators proposed by existing initiatives, and transforming experts-based indicators; 2) creating new ad hoc indicators; and 3) testing a first draft set of indicators in two pilot applications. These steps are detailed in the following.

First, we adapted existing indicators by downscaling, from international/national governance level assessments to local level, the valuable indicators proposed by existing initiatives in both forestry and other sectors, as well as by research studies. Namely, we adapted indicators from the WGI by the WB; from the FGDT by ARD-WB, the GFI by WRI, and the FAMFG by PROFOR/FAO; from the Rural Development Program of the European Commission. In Table 1, in relation to some governance key-dimensions, examples are provided of how international/national level indicators can be transformed and adapted to the assessment of any local agency. The problem of rescaling is particularly evident when dealing with indicators that are based on secondary data, available only at a country level (e.g. reduction of the GDP growth rate by a certain percentage during a defined period as a proxy for assessing government ineffectiveness). We also transformed expert-based indicators (Table 2). The indicators list (Table 3) reports the main sources for some of our indicators.

The second methodological step was the creation of new ad hoc indicators. First of all, from a detailed description of key sub-dimensions based on the collection of definitions and text analyses, we identified key aspects of governance to be measured (Secco et al., 2010); for those aspects for which we have been unable to find indicators in the literature (see step 1), we created new indicators¹³ considering: i) possible secondary or primary data availability; ii) appropriateness and coherence in describing key aspects of governance. Given the many relational aspects connected with the local governance of natural resources, we used Social Network Analysis (SNA) tools to create some of the new indicators. SNA allows the network structure and the behavior of individuals inside the network to be studied (Stockman, 2001) and proved to be useful for understanding the impacts of policy decisions and projects by examining the creation of networks among the actors involved (Bodin

and Crona, 2009). By means of relational data collection (mainly information flows, formal and informal collaborations), key-issues related to interactions between actors (at the same or different levels) can be assessed, such as centrality of public operators, reputational power, stakeholders representativeness, access to documentation, creation of new networks, divergences among stakeholders, and efficiency in informing actors. Several indexes typical of SNA were included in our analysis (see e.g. Hirschi, 2008; Ingold et al., 2010; Franceschetti, 2009; Prell et al., 2009; Bodin and Crona, 2009); 11 of them¹⁴ were transformed into indicators, being considered useful to assess some sub-components of governance (namely, certain aspects of effectiveness, capacity and participation). The indicators list in Table 3 (second column) mentions the SNA indexes we used to formulate some of our indicators.

On the basis of the results of the first two steps of the analysis, a preliminary set of 93 indicators, which includes both fact- and perception-based indicators, was developed. In the third step, we tested this draft set of indicators by collecting both secondary and primary data in two pilot applications. These were carried out in June–October 2011 in two UNESCO protected areas in Europe – namely, the Dolomiti Bellunesi National Park (DBNP), in the North of Italy, and the Durmitor National Park (DNP), in Montenegro.¹⁵

The data for the indicators were collected by means of questionnaires addressed to two categories of respondents: public officials employed by the local administration whose governance performance has to be assessed, and other local stakeholders.

An “ego-network” approach (e.g. Everett and Borgatti, 2005; Bodin and Prell, 2011) was adopted in the categories and stakeholders identification, assuming that one local organization (like a local public administration, such as a park or a local forest service, i.e. any local agency) commonly acts as main agent in coordinating and networking the other actors when implementing policy programs. Hence, such a local organization (which is typically public, but it can also be private or a community-based organization) is the focus in our local governance assessment. Objective measures (fact-based indicators) about governance performance deducible by means of formal documents and datasets analysis (secondary sources) were collected through the questionnaire submitted to the organization's Public Officials (POs), who know documents, procedures, rules, institutional structures, etc. The list of other stakeholders was identified through a name generator process, initially starting with the organization that has to be assessed and then completed in two rounds. This technique, known as snowball sampling, allows information to be obtained on actors that revolve around the organization's initiative (ego-network) and who are aware of the subject to be assessed. We identified 7 relevant stakeholders categories¹⁶ based on the perceived role of individuals and organizations in the

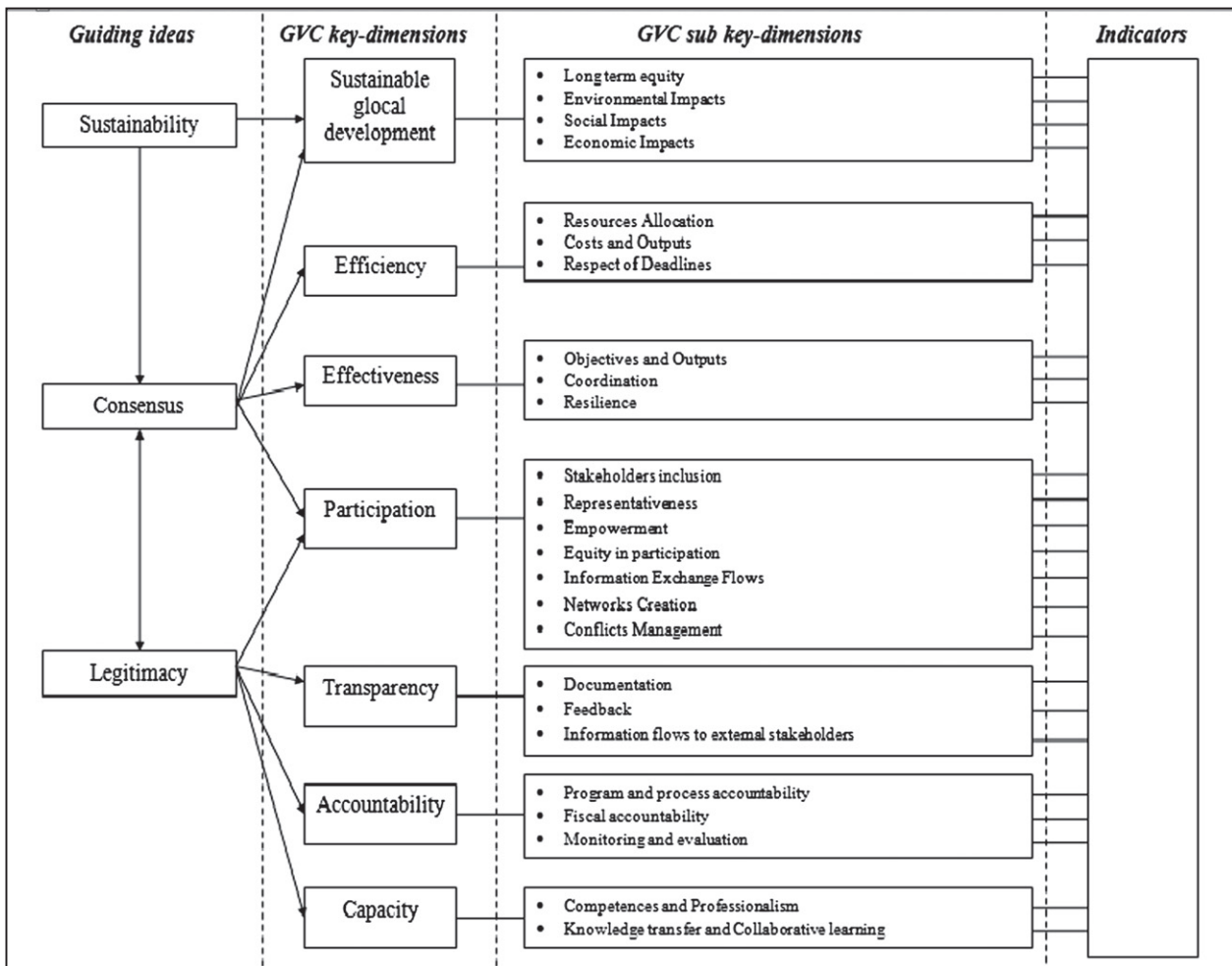
¹² The term “glocal” (i.e. a combination of global and local) refers to the attempt to find optimal and sustainable solutions to local problems in the era of globalization (Robertson, 1995), global and local processes being strictly “intertwined” (Swyngedouw, 1997 – p. 137). We use the term to summarize the idea that local projects' performances can positively or negatively affect the society-environment systems at a global level, as conceptualized by many scholars (e.g. Berkes, 2008; Marshall, 2008; Ostrom, 2009). Within the forest sector, a key-example are REDD+ single projects, the performances of which are expected to influence a global climate change. The basic idea, expressed by the famous phrase “Think global, act local”, was introduced in the 1960s in the environmental context and about 20 years later in the business context (Wikipedia, 2013).

¹³ For example, the indicator “Diversification of financial resources” (see Table 3) was created to describe the aspect of “secure financial resources for planning, implementing and monitoring” mentioned in the literature for describing the sub-dimension of governance “Resilience” within the dimension “Effectiveness”.

¹⁴ Indexes used to describe a network can be divided into those that analyze the position of the actor in relation to the other actors' positions in the network and those that describe the network structure (Chiesi, 1999 – p. 262). The indexes chosen to study the ego-networks in our analysis are (Hanneman and Riddle, 2005; Bodin and Crona, 2009; Scott, 2012): Degree Centrality (the number of nodes adjacent to a given node, compared to the total potential number of ties), Closeness Centrality (the distance of an actor from all others), Betweenness Centrality (the extent to which a “bridge node” lies between other 2 nodes in the network that are themselves disconnected), Density (the proportion of all possible ties that are actually present, which measures the extent to which all actors are tied to one another in the network), Compactness (the number of edges in the shortest path between each pair of nodes), Core/Periphery Analysis (where the core is the sub-group with the maximum density, while each periphery member is not directly connected to any of the other periphery stakeholders), and Clique Analysis (where a clique is a complete sub-graph of the network where each pair of actors is connected by a line). These are identified, for each indicator, in Table 3.

¹⁵ Key features of the two pilot areas. Dolomiti Bellunesi National Park was established in 1993 and named a UNESCO site in 2009, it involves 15 Municipalities with 80–100,000 residents; the total protected area is about 32,000 ha, with a staff of 14 plus 35 agents of the State Forest Corp. Durmitor National Park was established in 1952 and named a UNESCO site in 1980; it involves 3 Municipalities, with about 3,000 residents; the protected area is about 39,000 ha and has a staff of about 25.

¹⁶ Municipalities, Other Public Institutions, Mountain Experts, Tourist Information Points, Recreation-related Enterprises (sport activities, etc.), Restaurant and Reception Structures, and Local Producers.



Source: Secco et al. 2011.

Fig. 2. Local governance key-dimensions and sub-dimensions: a simplified conceptual framework. Source: Secco et al., 2011.

area (Prell et al., 2009), thus simplifying the “name generator” process. Subjective measures (perception-based indicators) about governance processes and structures (e.g. relational information among actors) were collected through the questionnaire submitted to these stakeholders.

As regards the SNA-based indicators (see Table 3), we gathered in our adjacency matrices “directed” data in a binary form (1 = presence of tie, 0 = absence of tie), without considering “loops”. Indexes were calculated in UCINET, a software package for analyzing social network data developed by Borgatti et al. (2002).

The indicators test was based on 43 respondents in DBNP (over 55 contacted stakeholders) and 13 respondents in DNP (respectively 78% and 100% of contacted stakeholders). On the basis of these pilot applications, 15 out of the 93 draft indicators have been removed. The presence of only two case studies did not allow us to apply multivariate analysis or other quantitative methods to better refine the set of indicators. Hence, the final list of 78 indicators has been selected on the basis of three main aspects. The first was data accessibility. For some potential indicators we found severe difficulties in data availability, depending both on information not obtained by the questionnaire to Organization's staff or documents review, and on all those variables based on the questionnaire to stakeholders that present a high number of missing values. The second aspect was the analysis on quantitative data gathered by means of the stakeholders' questionnaire. Correlation analysis has

been used to describe linear association between variables that have been used to build indicators: we expected that variables used to construct the same indicator were positively correlated, while variables used to evaluate different sub-dimensions didn't depend significantly on each other. For dichotomous variables we used odds ratio. Control questions were included in the first part of the questionnaire to check the coherence of the stakeholders' answers: we asked them to provide a few examples (both positive and negative) of what the Organization had actually done to guarantee/not guarantee the 7 key-dimensions of local governance. This enabled us to collect data in general perception of abstract concepts such as governance and its key-dimensions by using concrete facts that prove the validity of perceptions themselves.¹⁷ Finally, a logical comparison was made between expected and expressed indicators' results, by referring both to the indicators based on the POs questionnaire and those based on the stakeholders' questionnaire. The scores in the two case studies were compared for each indicator. Then, the logical order (“<”, “=”, “>”) in each pair was associated to the respective qualitative data collected by our first impressions and by extra experts interviews we conducted about the set of indicators (Secco et al., 2011). If a big dissimilarity was noticed, discussions were held on the indicator's relevance. The final number of indicators might be reduced to 62, removing

¹⁷ The range of these control questions varies from 0 to 3. They have been transformed in dummy variables to allow the comparison with dichotomous variables.

Table 1

Examples of indicators used at national/international level, not forest-governance specific, that can be adapted to local context.

Governance key-dimension	Source of indicators	Question/indicator	Examples of reformulation/adaptation to local context
Effectiveness, Efficiency	Worldwide Governance Indicators (WGI), Global Insight Business Conditions and Risk Indicators, by expert survey from Commercial Business Information Provider.	Bureaucracy: quality of the country's bureaucracy. The logic behind it is "the better the bureaucracy, the quicker decisions are made and the more easily foreign investors can go about their business".	<ul style="list-style-type: none"> • Answering average time (feedback). • Closeness centrality degree (SNA) of local agency's public officials. • Incidence of local agency's staff dedicated to the project and communication with actors.
Transparency	Worldwide Governance Indicators (WGI), Institutional Profiles Database (IPD), by experts in Public Sector Data Provider.	Transparency of public action in the economic field.	<ul style="list-style-type: none"> • Existence of periodic reporting in standardized forms.
Capacity, Participation	Worldwide Governance Indicators (WGI), World Economic Forum Global Competitiveness Report, by survey.	When deciding upon policies and contracts, Government officials favor well-connected firms	<ul style="list-style-type: none"> • "After-Before" collaboration Density (SNA), Collaborative learning among local stakeholders.

Source: our elaboration.

those indicators we can define as "conditionally accepted", i.e. that generated low incongruence (with respect to the three causes of removal: accessibility, analysis and logical comparison), both qualitative and quantitative, and that would require further analysis.¹⁸

The two pilot applications have also been used to test the development of a composite indicator able to concisely assess the local governance performances with respect to each governance key-dimension. One example is shown in Fig. 3. In order to calculate composite indicators, we integrated those indicators based on questionnaire interviews submitted to POs – which are composed on dichotomous variables (presence/absence of attribute) – with indicators based on the questionnaire to stakeholders – which are constructed on continuous variables. We normalized the latter using the technique "above or below" the median.¹⁹ Finally, we gave equal weight to each sub-dimension's indicators and aggregated the values inside each governance key-dimension.

5. Results and discussion

The final indicators selected for assessing the performances of local governance mechanisms are listed in Table 3. They are grouped according to the seven key-dimensions of governance (gray rows) and related sub-dimensions (first column), as identified in our general conceptual framework (see Fig. 2 – Secco et al., 2010, 2011). For each indicator, the title, a brief description and the range are provided. Much more information were elaborated (e.g. unit of measurement, variables associated to the indicator and verifier(s)²⁰), which are not reported here for limits of space.

¹⁸ See note 11.

¹⁹ Indicator takes value 1 if the raw value is above the upper quartile, 0 if below the lower quartile, 0.5 if within the interquartile range.

²⁰ Verifiers are possible sources of data, detailing meaning of concepts or words included in the indicator, reference values, i.e. additional information that helps assessors to properly interpret the indicator and obtain the required data.

In the final indicators selection, we followed the hierarchical framework used in the formulation of Sustainable Forest Management (SFM) standards (Lammerts van Bueren and Blom, 1997). From key-dimensions and sub-dimensions (Bezzi et al., 2009) that can be considered respectively as "principles" and "criteria", we selected indicators on the basis of the following two rules: i) each indicator belongs to only one sub-dimension; and ii) there is at least one indicator for each sub-dimension. This hierarchical structure allows a horizontal (no overlapping or duplication of indicators within the same level) and vertical consistency to be maintained (indicators are proxies to evaluate the sub-dimension where they are placed). Wherever possible, we tried to have at least one fact-based and one perception-based indicator for the same sub-dimension, in order to reduce the risk of bias/errors in the measurement of the quality of each governance sub-dimension (and thus of each governance dimension, and ultimately of the governance in itself). Moreover we used subjective indicators to have a crosscheck of results from more objective indicators' scores. Through indicators based on perceptions and relational information, i.e. those aimed at measuring the networks' density and social interrelations inspired by the local development programs/projects, the degree of involvement of the actors, the flows of exchange of information, reciprocity and trust, the representativeness of the stakeholders in the decision-making processes, and many other "less tangible aspects of governance" (Williams, 2011 – p. 6) should be captured in order to really understand its quality.

It is worth making five main general considerations about the set of indicators. First of all, even if we started from the most important international forest governance assessment initiatives, most of the indicators we propose can be applied not only in forestry, but – more in general – in assessing the quality of governance of local organizations governing natural resources and/or rural development processes. Secondly, most of them appear to be easy-to-be-detached and process-oriented indicators, good proxies of the aspect of governance to be assessed, but having being tested only in two pilot applications, further tests are necessary to corroborate the operational functionality of the assessment instrument and indicators' validity. In particular, 16²¹ of the indicators included in the final set need further testing and refinement in order to be fully validated as being valuable for assessing the quality of local governance. For example, indicator 1a.4 (Cost and benefit sharing mechanisms) is ambiguously interpreted by respondents; indicator 2b.2 (Transaction costs) often receives vague and affirmative answers; indicator 4c.1 (Influencing decision-making) is still too vague; indicator 6b.2 (Payment of prescribed charges) has predictable results for local governance by public institutions (which cannot state that they do not respect the laws!). As regards this latter point, additional indicators to evaluate the respect of the law by the assessed Organization must be integrated into the set, probably under a new key-dimension or sub-dimension to be called "Legality", this being a critical issue for the quality of governance (Cashore et al., 2010) and the indicators so far included on this aspect not being sufficiently developed. As regards other key-dimensions of local governance, we confirmed the complexity of assessing "Sustainable global development" (long-term impacts need to be verified; the assessment timeframe has to be adjusted to the policy-effects – Dwyer et al., 2008), and the fact that, surprisingly, the key-dimension "Transparency" seems not to be a determinant in defining the quality of local governance. Other methodological issues to be better analyzed in future research include the use of the "ego-network" approach for the selection of stakeholders to be interviewed (casual sampling of stakeholders would be more difficult to apply because the universe population is not clearly defined); there is also a need to identify additional objective/fact-based

²¹ The other 12 indicators that have been accepted but need further tests are: 1a.6 - Promotion of sustainability; 1d.2 – Economic relationships; 2a.4 – Use of technology; 2c.3 – Deadlines perception; 3a.2 – Objectives' attainment; 3a.5 – Perception of effectiveness; 4b.1 – Main actors' presence in the core; 3c.4 – Risk management resources; 4d.2 - Perception of participation; 5b.2 – Perception of feedback; 6a.1 – Rationale for decisions; 6a.3 – Perception of clarity of actors' roles.

Table 2
Examples of forest experts-based indicators and examples of their adaptation to local context.

Governance key-dimension	Source	Question/indicator	Problems	Examples of reformulation/adaptation
Transparency	"Roots for Good Forest Outcomes: an analytical framework for governance reforms", 2009, World Bank, annex 2, p.1	Are commercial timber forest products allocations from public forests open and transparent? - The authorities give clear, timely notice of all proposed policies, programs, laws, and projects - The authorities give clear, timely notice of most proposed policies, programs, laws, and projects - The authorities give clear, timely notice of less than half of proposed policies, programs, laws, and projects - The authorities seldom or never give clear, timely notice of proposed policies, programs, laws, and projects.	Four possibilities of answer, where the perception and knowledge of the expert is fundamental, and where the two "aspects" of the question (openness and transparency) are kept together.	<ul style="list-style-type: none"> • Presence/absence of official documents in which commercial timber forest products allocations are introduced. • Number of means (internet, paper, etc) used to inform the population.
Participation, Accountability	"The governance of forests toolkit (version 1): a draft framework of indicators for assessing governance of the forest sector", The Governance of Forests Initiative, September 2009, p.37	To what extent is there effective public participation in policy-making? - Opportunity for debates among various interest groups - Participation of local leaders and representatives - Participation of stakeholders affected by decisions on land use - Amount of participation - Breadth of participation by different stakeholders	Indicator is not exclusive to one dimension. Different units of measurement: difficulty in answering and aggregation for analysis. No time-bound indicator. No specific indicator (meaning of "different"?).	<ul style="list-style-type: none"> • Presence/absence of planning among various interest groups in each phase (ideation, planning, implementation, etc.) of the project. • Attraction capacity with respect of gender, age, profession, etc. (percentage with respect to the population proportion).

Source: our elaboration.

indicators in order to cross-check the information based on stakeholders' perception.

Thirdly, the assessment results can be visually represented on a radar graph, where radii represent the various key-dimensions of local governance. Fig. 3 shows the Dolomiti Bellunesi National Park example. This can be a powerful, concise tool for: (1) identifying the main weaknesses (e.g. Participation and Efficiency in the example of DBNP) and strengths (e.g. Accountability and Transparency) in the governance domain of a local Organization; and (2) communicating to the policy-maker the local governance performances with respect to a potential level of governance quality. Although the use of these standardized composite indicators leads typically to a quantitative-based assessment – that should allow comparisons among different assessed Organizations – we argue that comparability is acceptable only among those Organizations which have similar contextual conditions (e.g. in terms of institutional and legal frameworks). The main aim of our assessment instrument is the comparison, along the time scale, of a single Organization's own performances.

Fourthly, the proposed set seems to be easy to use and relatively cheap: we calculated that about one month's work of one qualified person is necessary (3–5000 €) for the local governance assessment (the only specialized activity being the use of the SNA software UCINET). Direct and indirect costs for the assessed Organization are not included. The estimation takes into account only the assessors' costs, and it is based on the time necessary to prepare the field survey (stakeholders contacting), to collect the data (filling in the semi-structured interviews on the basis of questionnaires: one for the

Organization's staff members who are public officials and one for the local stakeholders identified through the eco-network approach, i.e. snow-ball sampling) and to input/mine the data (using an ad hoc created file Excel).

Last but not least, the current contents and order of the sub-dimensions derive from our conceptual framework (Fig. 1), whose creation was functional to the creation of the indicators themselves, as through the "isolation" of more detailed concepts (see Section 3). Both the sub-dimensions and the indicators can now easily be re-arranged in a different way, associating them to other sets of "principles", "pillars" and "components" of governance (for example an indicator we used for Capacity could be moved to Effectiveness or Efficiency in another governance assessment framework), such as those developed by PROFOR/FAO (2011) and Kishor and Rosenbaum (2012).

6. Conclusions and recommendations

The improvement of multi-level and intra-level governance mechanisms is urgent for forestry and for other sectors related to natural resources, such as rural development. Some of the new forest challenges have a typically global nature (climate change, energy production, deforestation, forest degradation), others have regional/national nature (illegal logging, biodiversity conservation) and others are more spatially localized in specific socio-ecological systems (provision of forest-based ecosystem services, rural development). The most challenging issues are those that, being framed as globally or locally

Table 3
Summarizing list of final indicators for local governance assessing.

Governance sub-dimension	Indicator (and any source)	Description	Range ^a	
<i>Governance key-dimension 1: SUSTAINABLE 'GLOCAL' DEVELOPMENT</i>				
<i>a. Long-term equity</i>	Commitment to sustainability (Source: Stobbelaar and Leistra, 2010, Scaling&Governance Conf., abstract 92 p.34)	Presence/absence of formal commitment to sustainability and of environmental, social and economic objectives	0–4	
	Sustainability reporting	Presence/absence of standardized and at least annual sustainability reporting	0–3	
	Certification	Presence/absence of independent third-party environmental or social certification	0–1	
	Cost and benefit sharing mechanisms (Source: WB-ARD, 2009, annex 2, p.11)	Presence/absence of formal cost/benefit sharing mechanisms	0–1	
	<i>b. Environmental impacts</i>	Promotion of sustainability	Best practices for tourists and other end users are promoted	0–1
		Climate change projects (Source: Haniotis, 2011, presentation at the 122nd EAAE Seminar, Ancona, Italy)	Presence/absence in the past 5 years of specific projects for climate change impact reduction	0–1
	<i>c. Social impacts</i>	Environmental projects	Presence/absence in the past 5 years of specific projects for improving environmental impact	0–1
		Perception of environmental impacts	Environmental impacts are seen as positive by stakeholders	1–10
	<i>d. Economic impacts</i>	Social projects	Presence/absence in the past 5 years of specific projects for improving social impacts	0–1
		Social impacts perception	Social impacts are seen as positive by stakeholders	1–10
Added value		Number of stakeholders receiving economic benefits due to the organization's activities (projects/ programs) on the total of stakeholders.	0–100	
Economic relationships (Based on Density (formal collaboration) SNA index)		Number of "economic" (flow of formal collaboration) relationships among stakeholders on total number of stakeholders (density)	0–100	
	Economic impacts perception	Economic impacts on the area are seen as positive by stakeholders.	1–10	
	Economic development projects	Presence/absence in the past 5 years of specific projects for economic development	0–1	
<i>Governance key-dimension 2: EFFICIENCY</i>				
<i>a. Resources at location</i>	Use of time (Based on In-closeness centrality (flow of information) SNA index)	Quickness in informing stakeholders	0–100	
	Use of technology (Source: WB-ARD, 2009, annex 2, p.7)	Organization invests money in updating software or buying innovative technology tools	0–1	
<i>b. Costs and outputs</i>	Transaction costs	Presence/absence of a written estimated amount of transaction costs, at least as % on total costs	0–1	
<i>c. Respect of deadlines</i>	Defined deadlines	Number of projects with pre-defined timetable on total number of projects	0–100	
	Respect of deadlines	Number of extensions required on the n° of projects started in the last 5 years	0–100	
	Deadlines perception	Stakeholders perceived deadlines are respected	1–10	
<i>Governance key-dimension 3: EFFECTIVENESS</i>				
<i>a. Objectives and outputs</i>	Performances self-evaluation	Presence/absence of at least one annual self-evaluation of organization's performance for each governance dimension.	0–7	
	Objectives' attainment	% of achieved outputs	0–100	
	Interest creation	% of projects able to stimulate stakeholders interest	0–100	
	Phasing out (Source: EENRD, 2010)	% of projects with a phasing out or planned activities to continue collaboration beyond the funded period	0–100	
	<i>b. Coordination</i>	Perception of effectiveness	Stakeholders perceive that planned benefits have been properly delivered and received.	1–10
		Inter-organizational coordination	Presence/absence of coordination mechanisms of the organization with public institutions, private actors and other institutions outside the area	0–3
		Inter-sectoral coordination (Source: Hirschi, 2008, p.21) (Based on Core/periphery analysis (total collaboration) SNA index)	Number of represented sectors in the center of the network created by the organization's initiatives on the total socio economic-spectrum of the area	0–8
		Multi-level actions (Source: Milic et al., 2011, p.9)	Presence/absence of joint actions with international/national/sub-national organizations	0–3
		Multi-level network (Source: Hirschi, 2008, p.19) (Based on Cliques analysis (total collaboration) SNA index)	% of network cliques constituted by both public and private stakeholders in the total collaboration network	0–100
	<i>c. Resilience</i>	Perception of coordination	The organization is perceived to be able to effectively coordinate actors	1–10
Perception of integration		The organization is perceived to be integrated in the territory	1–10	
Diversification of financial resources		None of the financial sources is providing more than 50% of the total	0–1	
Risk management resources		Presence/absence of reserve funds for potential unexpected events (damages, ...)	0–1	
	Bidirectional flows (Source: Prell et al., 2009, p.4) (Based on In-degree centrality (flow of information) SNA index)	% of bidirectional flows of information between the organization and other stakeholders	0–100	
<i>Governance key-dimension 4: PARTICIPATION</i>				
<i>a. Stakeholders inclusion</i>	Adoption of participation	% of projects/program adopting participatory approaches in the past 5 years	0–100	
	Participation throughout the project cycle (Source: GFI, 2009, p.37)	Presence/absence of participatory approaches in decision-making in the 4 phases of project/program development	0–4	
	Stakeholders participation	% of actors that have taken part in stakeholders participatory events on each of the 4 project phases in the last 5 years	0–100	
	Participants recording	% of projects/programs for which participants to the meetings are recorded in the past 5 years.	0–100	

(continued on next page)

Table 3 (continued)

Governance sub-dimension	Indicator (and any source)	Description	Range ^a
<i>b. Representativeness</i>	Main actors' presence in the core (Based on Core/periphery analysis (flow of information) SNA index)	% of main actors in the center of the information network	0–100
	Represented interests	% of represented stakeholders that have taken part in stakeholders participatory events in the last 5 years	0–100
<i>c. Empowerment</i>	Facilitation to territorial coverage	Stakeholders participatory events are distributed in various sites within the area involved.	0–1
	Influencing decision-making	Presence/absence of formal procedures/rules for allowing stakeholders to influence decision-making.	0–1
	Fundamentals of empowerment	Feedback/comments/complaints from stakeholders are collected, categorized and archived.	0–1
	Confidence in the organization	% of stakeholders who think that their comments/feedback/complaints have real capacity to influence decisions	0–100
<i>d. Equity in participation</i>	Perception of empowerment	Stakeholders perceive the org. uses their comments/feedback/complaints	1–10
	Stakeholders involvement	% of stakeholders often making comments and suggestions to the organization	0–100
<i>e. Information Exchange flows</i>	Perception of participation	Stakeholders perceive participation as fair.	1–10
	Network cohesion (Based on Compactness (flow of information) SNA index)	Information compactness index	0–100
<i>f. Network creation</i>	Procedures for collecting comments	Presence/absence of formal procedure to allow stakeholders to make their comments/contributions even without taking part in meetings.	0–1
	Collaboration cohesion (Based on Compactness (total collaboration) SNA index)	Collaboration compactness index	0–100
<i>g. Conflicts management</i>	Stakeholders databases	Presence/absence of an updated exhaustive database of stakeholders	0–1
	Formal mechanisms (Source: WB-ARD, 2009, annex 2, p.4)	Presence/absence of formal mechanisms for conflicts/disputes management/resolution.	0–1
	Between stakeholders (Source: Franceschetti, 2009, p.55) (Based on Betweenness centrality (total collaboration) SNA index)	Betweenness role of the organization in collaboration	0–100
	Perception of conflicts	Stakeholders perceive that real/potential conflicts are properly managed by the org.	1–10
<i>Governance key-dimension 5: TRANSPARENCY</i>			
<i>a. Documentation</i>	Projects exhaustiveness	Number of projects with easy access to comprehensive information on: analysis of the context, objectives, outputs, logical framework, methodology, timetable, resources, financial plan	0–8
	Accessibility (Source: WB-ARD, 2009, annex 2, p.1)	Information on structure, decisions process, resources and projects with respect to the organization are publicly available on the web.	0–4
	Translation	Information on structure, decisions process, resources and projects with respect to the organization are available in at least one other language	0–4
	Updating (Source: GFI, 2009, p.38)	Information on structure, decisions process, resources and projects with respect to the organization are regularly updated.	0–4
<i>b. Feedback</i>	Perception of feedback (Source: WB-ARD, 2009, annex 2, p.2)	Feedback is perceived to be satisfactory by stakeholders	1–10
	Procedure for feedback (Source: WB-ARD, 2009, annex 2, p.2)	Absence/presence of formal procedure(s) to provide feedback to stakeholders requests/complaints etc.	0–1
<i>c. Information flows to external stakeholders</i>	Notification instruments (Source: Cashore, 2009a)	Presence/absence of notification instruments to near and distant stakeholders in the project cycle	0–2
	Visibility	Presence/absence of a method to calculate the annual website accesses, subdivided by month or user variables	0–1
<i>Governance key-dimension 6: ACCOUNTABILITY</i>			
<i>a. Program and process accountability</i>	Rationale for decisions (Source: Cashore, 2009a)	The rationale for decisions to affected parties is explained in written record(s).	0–1
	Organization chart	Presence/absence of a written internal organization chart and jobs description.	0–2
	Perception of clarity of actors' roles (Source: GFI, 2009, p.44)	The roles of the organization are perceived to be clear by stakeholders.	1–10
	Co-responsibility	% of stakeholders formally involved in projects/programs with co-responsibilities clearly identified	0–100
<i>b. Fiscal accountability</i>	Overlapping roles	The roles of the organization are perceived by stakeholders not to overlap with other actors' roles	1–10
	Visible salaries (Source: GFI, 2009, p.33)	There is publicly available evidence of salaries and commissions (fees).	0–1
	Payment of prescribed charges	There is public available evidence that applicable and legally prescribed fees, taxes and other charges are paid.	0–1
<i>c. Monitoring and evaluation</i>	Regular monitoring	Presence/absence of at least annual monitoring.	0–1
	Criteria for monitoring (Source: GFI, 2009, p.40)	Presence/absence of internally defined criteria and indicators to assess the organization's performances.	0–1
	Evaluation (Source: WB-ARD, 2009, annex 2, p.6)	There is evidence of external valuations carried out for programs/projects developed by the organization.	0–1
<i>Governance key-dimension 7: CAPACITY</i>			
<i>a. Competences and professionalism</i>	Degree of diversification among staff (Source: GFI, 2009, p.50)	Presence/absence of staff's curricula and the degree of diversification among the staff employed	0–2
	Co-financed projects	% of co-financed projects	0–100
	Perception of professionalism	The organization is perceived to be adequately staffed.	1–10
		% of bidirectional flows of collaboration among stakeholders	0–100

Table 3 (continued)

Governance sub-dimension	Indicator (and any source)	Description	Range ^a
b. Knowledge transfer and collaborative learning	Mobilization of knowledge (Source: Ingold, 2008, p.8) (Based on Density (flow of information) SNA index)		
	Knowledge course (Source: WB-ARD, 2009, annex 2, p.9)	The org. organizes specializing courses open to residents and stakeholders	0–1
	Overall reputational power Based on Reputational Power SNA index	The reputational power is also distributed among actors outside the organization	0–8

SNA = Indicators created using Social Network Analysis indices.
Source: our elaboration.

^a The 'range' of indicators is divided into three categories:

- Likert scale [1–10], for stakeholders' perceptions.
- Percentage [0–100].
- Dichotomous indices [0–1] and sum of dichotomous indices [0–2; 0–3; 0–4; 0–7; 0–8].

caused in an informal-institutional analysis of forest governance, lead to the arising of very different policy issues (Arts and Buizer, 2009), such as climate change and deforestation. These global problems need multi-level and intra-level coordination and interactions. All the forest policy decision-making levels are interconnected vertically, and what happens at the lower level matters. While international, regional and national forest governance frameworks influence (positively or negatively) the implementation of local programs, projects and actions, local governance performances and their effects “on the ground” may inform national and global policy developments, thus contributing to shape forest governance at higher and more major levels (as shown by the example of REDD concept re-scaling and by Fig. 1). There can be various patterns of scaling of forest policy and governance processes: down, up, based on double loop, recursive, etc. But whatever the pattern is, public forest organizations at both local and sub-national levels have the chance to maintain a key role, acting as a link: both horizontally (intra-level), mediating or facilitating interactions between forest stakeholders in formal or informal networks; and vertically (multi-level), interpreting and adapting forest policy for local implementation and providing feedback to more effectively reform forest regimes at higher levels.

Key theoretical areas connected with scale issues, as suggested by Gibson et al. (2000) in forest policy and governance analysis include: (i) understanding how different levels (on administrative, spatial or temporal scales) affect the social and political phenomena and institutional processes related to forest governance; (ii) studying how theoretical proposals and topics derived from phenomena at a global, regional or national level may be generalized to a local level, and vice versa (Arts and Buizer, 2009); and (iii) finding out how governance processes can be optimized at particular levels on a scale, taking into special consideration the role of social and economic networks among actors (Bodin and Crona, 2009). In our opinion, how the quality of forest governance at the local (lower) level influences the quality of governance at other (higher) levels should be included in the list of emerging key research topics, so assessments are needed. However, a limited number

of concrete assessments have been carried out to date and a robust, comprehensive and tested methodology for both national and local governance assessment is still lacking.

Our paper, focusing on the development of a set of indicators for assessing forest governance performances at local level, contributes to exploring these issues and bridging the related methodological gaps. The set can have different end users that can be divided in two groups reflecting the two main types of evaluation (internal and external). Internal users are for example the local organizations in charge of forest resources in a given geographical/administrative area, which can use the set for self-evaluating their own governance performances and voluntarily improving them to meet the basic principles of good governance in the sector. These can be the public forest administrations facing a de-institutionalization process and which are challenged by the increasing complexity of interactions required with other stakeholders (i.e. civil society, the market). External users can be other organizations or agents (acting at the same or higher levels with respect to the local organization that is being assessed), e.g. in charge of: i) evaluating and monitoring forest policy and governing programs' implementation at a local level (e.g. effectiveness and success of forest investments); ii) developing new policy instruments or institutional reforms; iii) engaging civil society, the local community and private sector in innovative private-public ventures; or even iv) others (donors, advocacy groups, etc.). In all cases, the end users might find the set of indicators of interest for identifying weaknesses and strengths in the local governance processes and structure with respect to an initial “governance baseline” (changes in time scale) or an ideal “good governance model” (discrepancies with respect to a minimum accepted level of quality of the governance, which remains a very crucial and sensitive political and cultural issue).

On the basis of the first empirical evidence emerging from the two pilot applications, the set of process-oriented, mixed fact-/perception-based indicators we propose seem to be sufficiently simple, cheap, reliable and expeditious to be used also by small organizations and for applications in other sectors (e.g. by Local Action Groups under the European Commission Rural Development Program – Birolo et al., 2013). Nevertheless, despite the encouraging results obtained so far, further tests (multivariate analysis, different aggregation weights, etc.) are needed to refine it and corroborate its validity. In particular because: (1) the number of indicators is still high (78), and should be reduced; (2) better indicators are needed for certain complex dimensions and sub-dimensions of governance (such as “Sustainable global development” and “Resilience and institutional changes”); (3) new indicators have to be included in order to assess another key-dimension of governance that should probably be “isolated” in the set (“Legality”); and (4) full cost and benefits of its use should be estimated. Another interesting area for future research would deal with the potentials and limits in scaling up the local governance indicators to the national (or higher) level of forest governance assessments.

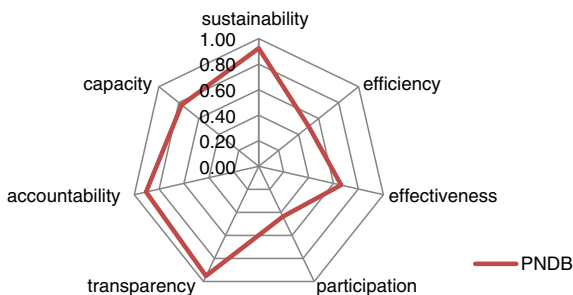


Fig. 3. Radar graph of DBNP's governance performances. Source: our elaboration.

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