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Assessing Coherence between the National Forest Policy and UNFF Goals: the case study of Pakistan

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Summary

Forests are important in enhancing biodiversity, providing socio-economic benefits and climate change mitigation. FRA 2015 report exhibited that global net forest loss rate was 0.13% from 1990 to 2015. Realizing criticality of circumstances, UN devised strategic plan for forests (2017-2030) for Sustainable forest management. As a member of FAO and UNFF Pakistan had adopted several forest policies from 1955 to 2015 for management of forest resources. Still the country has highest deforestation rate in the region. The limited understanding of how to make these policies vertically coherent is among the factors that hinder effective adaptation action. That's why it is important to assess whether the policies adopted are coherent with international forest policies and implemented on ground. We have chosen the case study of Pakistan to analyze level of coherence in adoption and implementation of forest policies with UNFF Goals. Methodological approach consisted of content and comparative analysis. We divided the UNFF goals into Six thematic areas. The content analysis was performed to analyze policy coherence between UNFF goals and NFPP at formulation stage. Comparative analysis to evaluate coherence between NFPP and UNFF goals at implementation stage. The results are significant for explanation of level of NFPP coherence with UNFFF goals. At policy adoption, the risk ratios (RR) 2.35, 1.22 and 1.72 of NFPP and UNFF goals for thematic areas 1, 2 and 5 shows high coherence. While RR values 0.61, 0.59 and 0.33 of NFPP for thematic areas 3, 4 and 6 demonstrate low coherence towards achieving UNFF goals. Comparative analysis at implementation level shows that NFPP has low coherence for 2, 3, 5 and 6 UNFF goals. Low coherence is also observed to achieve deforestation objective for UNFF goal 1. This study concludes that formulation of policy, articulation of targets, restoration of forests by mobilizing financial resources are not sufficient to address forest resources. Policy-based legislation is required, together with development of a supportive collaborative multi-stakeholder approach at different levels of governance, backed up by effective, collaborative monitoring and enforcement for sustainable management of forest resources. The study will provide insight for policy makers in formulation of future forest policies.

Keywords: Forest policy, Coherence, UNSPF goals, Sustainable forest management, Content analysis.

Summary (Italian)

Le foreste sono importanti per migliorare la biodiversità, fornendo benefici socioeconomici e mitigazione dei cambiamenti climatici. Il rapporto FRA 2015 ha mostrato che il tasso di perdita netta globale delle foreste era dello 0,13% dal 1990 al 2015. Realizzando la criticità delle circostanze, l'ONU ha elaborato un piano strategico per le foreste (2017-2030) per la gestione sostenibile delle foreste. Come membro della FAO e dell'UNFF, il Pakistan ha adottato diverse politiche forestali dal 1955 al 2015 per la gestione delle risorse forestali. Tuttavia, una comprensione limitata di come rendere queste politiche verticalmente coerenti è tra i fattori che ostacolano un'efficace azione di adattamento. Il paese ha ancora il più alto tasso di deforestazione nella regione. Ecco perché è importante valutare se le politiche adottate sono coerenti con le politiche forestali internazionali e attuate sul campo. Abbiamo scelto le case studi del Pakistan per analizzare il livello di coerenza nell'adozione e nell'attuazione delle politiche forestali con gli obiettivi dell'UNFF. L'approccio metodologico consisteva nel contenuto e nell'analisi comparativa. Abbiamo suddiviso dell'UNFF goals in sei aree tematiche. L'analisi del contenuto è stata eseguita per analizzare la coerenza delle politiche tra dell'UNFF goals e il NFPP nella fase di formulazione. Analisi comparativa per valutare la coerenza tra gli obiettivi NFPP e UNFF in fase di implementazione. I risultati sono significativi per la spiegazione del livello di coerenza NFPP con gli obiettivi UNFFF. All'adozione della politica, i rapporti di rischio (RR) 2,35, 1,22 e 1,72 degli obiettivi NFPP e UNFF per le aree tematiche 1, 2 e 5 mostrano un'elevata coerenza. Mentre i valori RR 0,61, 0,59 e 0,33 di NFPP per le aree tematiche 3, 4 e 6 dimostrano una bassa coerenza verso il raggiungimento degli obiettivi UNFF. L'analisi comparativa a livello di implementazione mostra che NFPP ha una bassa coerenza per 2, 3, 5 e 6 obiettivi UNFF. Si osserva inoltre una bassa coerenza per raggiungere l'obiettivo di deforestazione per l'obiettivo UNFF 1. Questo studio conclude che la formulazione della politica, l'articolazione degli obiettivi, il ripristino delle foreste mediante la mobilitazione delle risorse finanziarie non sono sufficienti per affrontare le risorse forestali. È necessaria una legislazione basata sulle politiche, insieme allo sviluppo di un approccio collaborativo di sostegno a più parti interessate a diversi livelli di governance, supportato da un monitoraggio e un'applicazione efficaci e collaborativi. Lo studio fornirà approfondimenti ai responsabili politici nella formulazione delle future politiche forestali.

Parole chiave: Politica forestale, Coerenza, Obiettivi UNSPF, Gestione forestale sostenibile, Analisi dei contenuti.

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List of Acronyms

UNFF:	United Nations Forum on Forests
NFPP:	National Forest Policy of Pakistan
UNSPF:	United Nations Strategic Plan for Forests
FRA:	Forest Resource Assessment
FAO:	Food and Agriculture Organization
MEA:	Millennium Ecosystem Assessment
GDP:	Gross Domestic Production
GoP:	Government of Pakistan
IGF:	Inspector General of Forests
USAID:	United States Agency on International development
IPF:	Intergovernmental Panel on Forests
UNECOSOC:	United Nations Economic and Social Council
RR:	Relative Risk/ Risk Ratio
CDA:	Cholistan Development Authority
MAF:	Ministry of Agriculture and Forestry
MCI:	Ministry of Commerce and Industries
NFDP:	National Forest Development Program

FTE:	Full Time Equivalence
ESP:	Economic Survey of Pakistan
R-PP:	Readiness Preparing Proposal
FCPF:	Forest Carbon Partnership Facility
UN FLEGT:	United Nations Forest Law Enforcement, Governance and Trade
WTO:	World Trade Organization
CCF:	Chief Conservator of Forests
US:	United States
FSC:	Forest Stewardship Council
PEFC:	Program for the Endorsement of Forest Certification
IUCN:	International Union for Conservation of Nature
MHA:	Ministry of Home Affairs
KFS:	Korean Forest Service
SFM:	Sustainable Forest Management
UNFCCC:	United Nations Framework Conventions on Climate Change
KP:	Kyoto Protocols
PA:	Paris Agreement
UN:	United Nations

EU:	European Union
IUFRO:	International Union Forest Research Organization
MAR:	Mean Annual Rainfall
REDD:	Reduced Emission from Deforestation and Forest Degradation
KPK:	Khyber Pakhtunkhwa
NGO:	Non-Governmental Organization
COFO:	Committee on Forestry
CFD:	Committee on Forest Development
WWF:	World Wildlife Fund
ITTA:	International Tropical Timber Agreement
ITTO:	International Tropical Timber organization
UNCED:	United Nations Conference on Environment and Development
UNCCD:	United Nations Convention on Combating Desertification
UNCBD:	United Nations Convention on Biodiversity
IPCC:	Intergovernmental Panel on Climate Change
Ha:	Hectare
C & I:	Criteria and Indicators

1. Introduction

A number of developments have affected the way forests are governed, ranging from globalization, decentralization and privatization to changing demand for forest products and services from growing population. Other factors include enhanced awareness of the role of forests in regulating climate and in providing other environmental services; greater recognition of the multi-functionality of forests; and a shift from timber-centered to people/service-centered forest management (UNSPF, 2017). This pose pressure on forest policy making institutions and policy makers to devise forest policies considering multilateral problems for sustainable management of natural resources.

Policy coherence as an attribute of policy that systematically reduces conflicts and promotes synergies between and within different policy areas to achieve the outcomes associated with jointly agreed policy objectives (Nilsson et al., 2012). Policy coherence reflects the ability to ensure the conditions so that what is being proposed is achieved and the policy can be defined as effective. Policy coherence is necessary to reduce the degree of duplication and initiative fragmentation, enhance ability of developing countries for policy implementation and efficient utilization of available resources (Duraiappah et al., 2007), leading to better efficiency and reducing competition for the same budgets and resources (Akhtar-Schuster et al. 2011).

Coherence could be vertical and horizontal. Vertical coherence means coherence of policies across different levels of governance (international to national). While horizontal coherence describes coherence of different policies at the same level (national level cross-sectoral policies) (Duraiappah et al., 2004). Policy decisions taken at institutional level have impacts on institutions so policy coherence at adoption and implementation level is necessary for effective implementation of policies (Sabatier, 1988). Despite policy interactions receiving global attention but there is little focus on interactions between policies at national and international level especially in developing countries. One of the main reasons for non-effectiveness and failure of policies is lack of coordination and coherence from international to national levels (Oberthur et al., 2006a). In another study Kalaba et al., 2014 noticed that there is little stress on international to national policies in developing countries.

1.1 Main problem

Forests plays key role in providing number of ecosystem services i.e. provisioning, supporting, regulating and cultural and contribute towards human well-being globally (MEA, 2005). Global Forest Resource Assessment (FRA) report 2015 (FAO, 2015) the world forest cover reduced to

3999 million ha in 2015 compared to 4128 million ha in 1990 with a net loss of 129 million ha forest cover at the rate of 0.13 percent annually. This report raised serious questions about the concepts and policies related to sustainable forest management. The figure 1 elaborates the global tree cover loss trend. It indicates that there is continuous increase in tree cover loss. During last three decades, a large number of recommendations are provided by international institutions and processes for sustainable forest management (Humphreys, 2006). Since 1990, the climate change became a hot issue in the international agenda, this leads to the establishment of international institutions i.e. United Nation Framework Convention on Climate Change (UNFCCC) and United Nations Forum on Forests (UNFF) signing of protocols i.e. Kyoto Protocols (KP) (Cadman et al., 2017) and Agreements i.e. Paris Agreement (Almer & Winkler, 2017) to devise common strategies for sustainable forest management as a part of climate change mitigation. "Sustainable forest management" is defined by the UN as "a dynamic and evolving concept, that aims to maintain and enhance the economic, social and environmental values of all types of forests, for the benefit of present and future generations" (UNFF, 2007). Since 90s, forest policies have gone through tremendous changes in Objectives, goals and measures from international to national level. In recent era it is rare that problems influence only a single sector. One sector is usually inter-linked directly or indirectly, with a wide range of other sectors. Policy decision on institutional level have effects on many sectors and institutions (Sabatier, 1988). With the emergence of sustainable development paradigm, there is apt need to tackle complexity of objectives, instruments and their implementation while keeping in view the social, environmental and economic impacts of these policies. Policy coordination and coherence is vital in implementation of policies in true sense (Lenschow, 2002).

Figure 1 Global forest cover loss trend. source: global forest watch

International forest policy forums like UNFF founds that forest policies should be participatory, iterative, coordinated and absorbed at all levels to achieve sustainable development goals (Zingerli et al., 2014). Kalaba et al., 2014 found that irrespective of stress of global governance on environment issues there was little stress on international to national policies especially in developing countries.

In Pakistan previous research studies discussed the evolution of forest policies in Pakistan, pros and cons of these policies and their impact on sustainable livelihood (Shahbaz et al., 2007), role of institutions and stakeholders in formulation and implementation of these policies (Yusuf, 2009) and discussed in details the implications of these on different aspects of forest

management. However, the topic of vertical policy coherence in context of Pakistan has not explored yet. The study of Policy coherence will provide us the information about the level of consistency of national forest policies in line with international recommended policy protocols.

1.2 Aims of the research

It is pertinent to analyse if the international forest policies are absorbed in national forest policy. The approach adopted in this study to describe policy coherence, analysis would focus on policy outputs and its implementation. We will use United nations strategic plan for forest (UNSPF 2017-2030) adopted by UNFF as reference policy document defined at international level. We use Pakistan forest policy as a case study. The goal is to verify how UNSPF 2017-20130 have been absorbed in national forest policy of Pakistan and its implementation on ground.

Therefore, this study adopts the research questions;

Does the national forest policy of Pakistan coherent with UNFF forest goals?

1. How many UNFF policy goals are absorbed in national forest policy of Pakistan?
2. I identify some of them to investigate how these absorbed policies are implemented at national level with special context of deforestation, sustainable forest management, poverty reduction, governance and policy coordination.

1.3 Structure of thesis

The thesis adopts the quantitative approach for analysis of forest policy coherence between national and international policy documents. In Section two, the importance of forest policies and forest policy coherence for sustainable forest management, international forest policy discourse, Pakistan forest heritage and forest policies processes are described.

The third section presents description of materials used for analysis. It includes description of UNSPF 2017-30 document commonly recognised as UNFF goals and NFPP document their objectives and salient characteristics. The fourth section describes the methodological choices made for research. The study adopts the comparative analysis to explain the coherence between NFPP policy objectives and UNFF goals. Explained the framework espoused to define relative importance of key terms in thematic areas to use it as coding in Yoshikoder software for content analysis. While for assessment of coherence at implementation level, we use comparative analysis to analyse the secondary data collected from national and provincial authorities and FAO global forest resource assessment country report, Pakistan, 2015.

Section five describes the results of quantitative content and comparative analysis and explains the coherence between national forest policy and UNFF goals. Section six delivers the answers to the research questions. Moreover, it also presents the implications and limits of this thesis. Section seven provides the recommendations and food for thought for future studies.

1.4 Importance and Relevance of this research

This research investigates the forest policy coherence between the NFPP policy objectives and UNFF goals. With the advent of climate change phenomenon, role of forests in climate change mitigation, trans-boundary nature of problems and for sustainable management of forest resources, UNFF emerged as key player in providing platform for discussing issues and adopted policies for sustainable management of forest resources. There is an apt need to have national forest policies coherent to international so that it will enhance and support international policies for common shared forest goals. That is why it is important to investigate the policy coherence between NFPP and UNFF goals. It will provide the information on coherence of policies and will help in pinpointing the areas where further actions are required to improve the present policies.

2 Background

2.1 Forest policy

2.1.1 Forest policy concepts

A first formulation of forest policy concept is due to Worrel (1970), according to which it "specifies certain principles regarding the use of a society's forest resources which is felt to contribute to the achievement of some of the objectives of society". Setting taken up later by Husch (1987) acquiring broad consensus. Cubagge et al., (1993), contextualizing the forest policy among the public policies and define it as that policy "dealing with the use and management of the forest, which are key elements: i) proposing; ii) pattern of decisions over time; iii) actors; iv) problem or matter of concern; v) social choices ", while Sandulescu et al., (2007) extends the definition of Dye public policy (Dye 1972) to the forest context, stating that the forest policy is" what governments choose to do within their forests jurisdiction ".

FAO (2010) described forest policy as "a forest policy is widely understood as a negotiated agreement among government and other stakeholders on a shared vision and goals for country's forests and trees and their use". The FAO definition reflects the policy formulation and consultation process which supported the development of Forests, products and people.

The ultimate responsibility, authority and accountability for national forest policy rests with national governments and the stakeholders who help to develop and implement it – and whose actions make up the de facto policy. Policies should facilitate sound decisions on forests and trees and their sustainable use – decisions that meet the society's expectations. Such policies must be designed to respond to the changing needs of different groups and to emerging challenges e.g. climate change and opportunities (COFORD, 2018). Keeping in view the new challenges policy makers introduced modern approach towards policy adoption for sustainable management. The figure 2, illustrate the comparison of traditional and modern approach towards policy formulation and adoption.

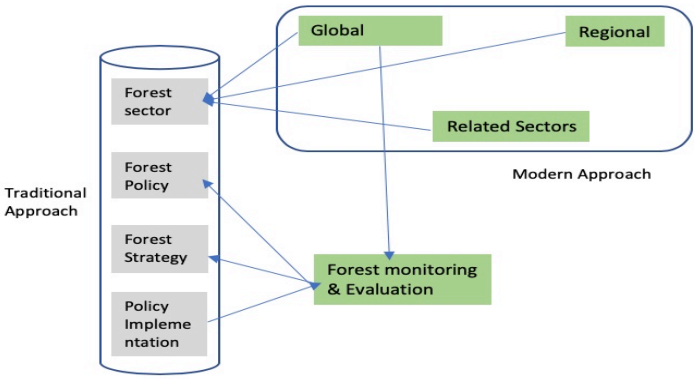


Figure 2: Traditional vs modern approach to policy formulation and adoption.

Source: COFORD, 2018

While understanding the widening of the range of forest governance FAO redefined the forest policy as "a negotiated agreement between government and stakeholders (i.e. all those who depend on or benefit from forests or who decide on, control or regulate access to these resources)

on the orientations and principles of actions they adopt, in harmony with national socioeconomic and environmental policies, to guide and determine decisions on the sustainable use and conservation of forest and tree resources for the benefit of society" (FAO, 2017).

Policies are formulated, implemented, monitored, evaluated, analyzed and on the bases of previous experiences and reports amended or reformulated. So, it is a spontaneous cyclic process. The policy cycle comprises firstly of policy formulation, which determines the issues to be resolved and standardized solutions in the form of programs; secondly of policy implementation, which entails the practical application of formulated programs to the issues; (krott, 2005), thirdly of policy evaluation and monitoring, which assesses the formulation and implementation of program (Brukas et al., 2004).

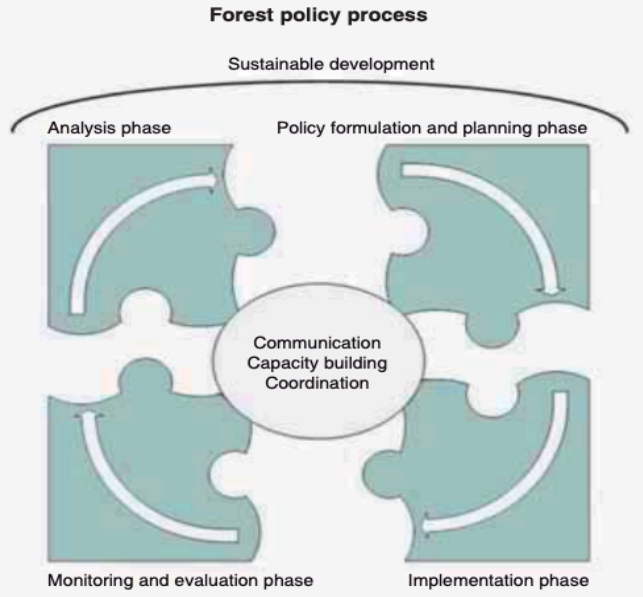


Figure 3 Forest policy process adopted from FAO 2001

As from the above definition Policymaking is an iterative (repetitive) process, and it is important to view it in this light for two reasons. First, in an iterative process experiences and lessons learned can be more easily considered to inform and improve coordination. Second, iteration helps to maintain a dialogue on the policy and its implementation after the process of developing a formal policy has concluded. The figure 3 illustrates the forest policy process adopted from FAO 2001. Ongoing dialogue, and an established platform for it is often a crucial component in implementing policies, as many concrete details in the implementation of the national forest policy need to be discussed or negotiated after it has been adopted. Established mechanisms for dialogue also make it easier to benefit from diverse lessons and experiences in implementing agreed policies and to coordinate subsequent planning (FAO, 2010).

To ensure that a forest policy process is maintained and adaptive to changing circumstances, many countries have set up national forest policy platforms, forest forums or similar mechanisms. These facilitate continuing communication and coordination among different stakeholders, response to emerging issues and integration of experiences or new initiatives in policy adaptation. Policies need to be clear regarding the implementation process including specifying the institutional structure for implementation, the role and responsibilities within implementing

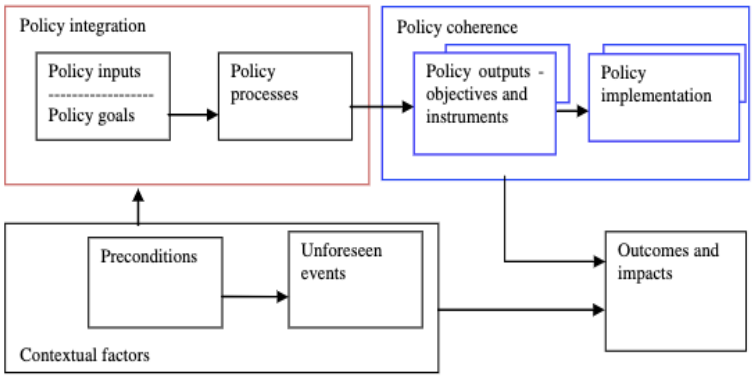
institutions, the required resources, the timeline, and arrangements for monitoring and evaluation (Ranabhat et al., 2018).

The causes of domestic policy change cannot be found at the national level only. They are not limited to isolated responses to global problem pressures either. Especially since the 1970s, scholars in comparative political science and international relations have argued that international political processes, actors and institutions increasingly affect national policy decisions (Howlett et al., 2002).

2.1.2 Forest Policy coherence

Policy coherence is defined as "the systematic promotion of mutually reinforcing policy actions across government departments and agencies creating synergies towards achieving the agreed objectives" (OECD, 2002) .The high rates of deforestation and forest degradation in developing countries raised concerns regarding effectiveness of national forest policies and their consistency to international policy regimes (Ravnkilde et al., 2010). Policy coherence is desirable (May et al., 2005) because different policies interact at the operational level and this can influence their effectiveness (Oberthür et al., 2006). Kumar Duraiappah and Bhardwaj (2007) examined development and environment policy coherence at the international level for the International Institute for Sustainable Development, using content analysis of policy documents between fields.

Den Hertog and Stross (2011) found a lack of delineation between the term's coherence and consistency. Similarly, a potential source of confusion is arguably the lack of delineation between policy integration and policy coherence. As seen above, many coherence studies have tended to focus on procedural aspects (OECD, 2002; Kivimaa et al., 2013). The approach taken in this study to delineate policy coherence analysis is to focus on policy outputs (including objectives and associated implementation arrangements), whereas policy integration analysis is primarily concerned with upstream policy making processes and the associated institutional arrangements. The figure 4 represents the impact of policy coherence on outcomes in a policy analytical framework.



Source: adapted from Dunn (2003) and Nilsson *et al.* (2009).

Figure 4 Policy coherence in a policy analytical framework

The separation is a heuristic aid – in reality process, outputs and outcomes are of course closely linked. The need for policy coherence is more acute for developing countries because better coordination and coherence will reduce duplication and fragmentation and, efficiently pool and utilize limited resources to achieve common objectives (Duraiappah et al., 2007).

Nilsson et al., (2012) illustrated the problem with examples from the European Union (EU) in which polices were coherent at the level of objectives but contradictory at the level of implementation.

Policy interaction exists at either horizontal or vertical dimensions. Horizontal policy interaction is the interplay between policies at the same level of governance (e.g. national or regional policies), while vertical interaction occurs between policies at different spatial scales of governance (Young, 2002). Policy interaction is an important variable in understanding the effectiveness of policies (Cowie et al., 2007) and their coordination to 'strive for the same target through mutually supportive policies and strategies.

2.1.3 International Forest Policy discourse

The recognition of forest issues at international forums dates back to the formation of the International Union of Forest Research Organisation (IUFRO) in 1896, for decades, its cooperation and guidelines were limited to provision of technical assistance on forest management for improving silviculture and timber production (Humphreys, 2007). FAO remained closely associated with forest related policies since its inception in 1945 by publishing forest resource assessment reports, FAO led discussions in COFO on policy and technical issues faced by member countries. FAO committee on forest development (CFD) played active role in addressing issues related to tropical forest in 1967 (Muhammad et al., 2008). In 1980s, several NGOs i.e. WWF and civil society echoed their concerns regarding extensive deforestation of tropical forests and illegal logging in tropical regions that leads to materialisation of ITTA in 1983 and ITTO in 1986 (SINGER, B. 2008), whose objective was "To encourage the development of national policies aimed at sustainable utilization and conservation of tropical forests and their genetic resources, and at maintaining the ecological balance in the regions concerned." and provides policy guidelines for sustainable forest management of natural tropical forests for timber production (ITTO, 1990). United Nations Conference on Environment and Development (UN, 1992) Rio de Janeiro summit was twenty years follow up of Stockholm convention 1972. The scientists and participants were ambitious of signing legally binding agreement with member countries on climate change, combating desertification and biodiversity. Their efforts resulted in signing 3 three Conventions on climate change, biological diversity and combating desertification. The fourth convention on forest was not accepted from countries, but a general agreement were

found to transform the forest convention in an "Non-Legally Binding Authoritative Statement of principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Types of Forests" also named as Forest Principles or also Rio Forest Principles.

According to CBD the member states shall responsible for developing national strategies for conservation and sustainable use of biodiversity and their integration in relevant sector or cross sectoral policies. The commitments were general, legally non-binding and rely on state prerogative of implementation or adoption of convention (Wang, S. 2001).

Non legally binding UNFCCC adopted in 1992 with objectives “The ultimate objective of this Convention and any related legal instruments is to achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner” (Dutschke. M, 2005). In article 3 paragraph 1 of Kyoto protocol it was conveyed that member countries will ensure to reduce their emissions of greenhouse gases by 5% below then 1990 levels during commitment period 2008 to 2012. The article 2a stress on protection of carbon sequestration sinks, sustainable forest management, afforestation and reforestation to decrease emissions (UN, 1998).

In Intergovernmental Panel on Climate Change (IPCC) 2007 report it was recognised that forest loss and degradation is responsible for 20% of global greenhouse emissions and they adopted Reduced Emissions from Deforestation and Forest Degradation (REDD) agenda which is important for climate negotiations and reduction in deforestation and forest degradation (kanninen et al, 2007) later on named REDD++ with the inclusion of two other objectives enhancing forest carbon stock and sustainable forest management (Corbera et al., 2011).

2.2 Pakistan forest heritage

2.2.1 Forest area and climate

The Islamic Republic of Pakistan emerged as independent state from British colonial rule in 14th august 1947.It is an oblong stretch of land between the Arabian sea and Karakoram mountains, lying diagonally between 24° N to 37° N latitudes and 61° E to 75° E longitudes, covering an area of 87.98 million hectares. The country has tropical, subtropical, temperate and alpine scrub forests (FAO, 2009). It is sixth populous country in the world having a population of 207 million people with per capita gross domestic product of 1545$ in 2017 (GoP, 2017). Pakistan is a federation comprising of four provinces i.e. Punjab, Sindh, Balochistan, Khyber Pakhtunkhwa, semi provincial territory of Gilgit-Baltistan and administrative area of Azad Jammu and Kashmir. Topographically Pakistan is a blend of landscapes having deserts, plains, forests, hills and plateaus. It can be divided into six major regions: northern mountains, northern Plateau, western mountains, Balochistan plateau, south-eastern deserts and Indus plains (Ahmad, et al, 1998). Pakistan stretches from coastline area of Sind province along Arabian sea in the south to Himalayan mountain range of KP province in north. The country categorised in arid to dry temperate climate due to change in average temperature and mean rainfall distribution. Pakistan lies in Monsoon region. The figure 5 represents the forest cover map of Pakistan.

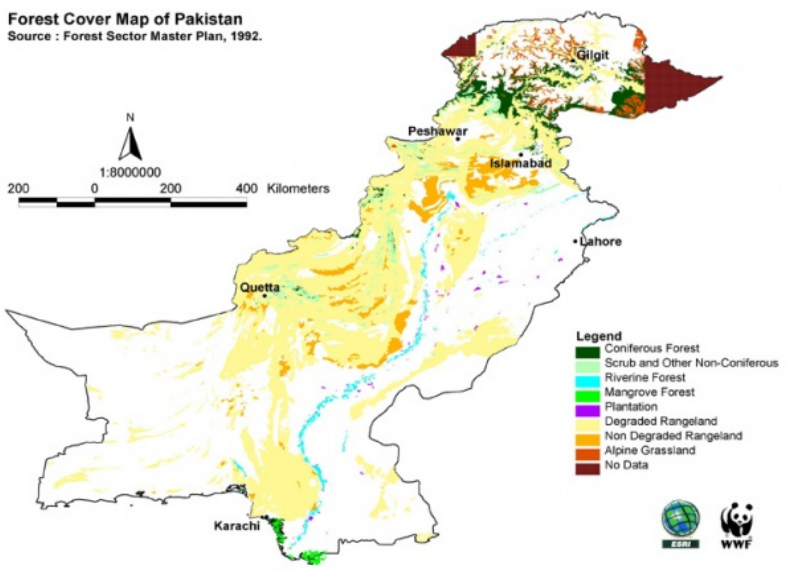


Figure 5: Forest cover map of Pakistan

However, its climate is more continental than other south Asian countries which are under more monsoon regime. MAR is 100cm or above in north-eastern part of the country while south-western part receives less than 50cm MAR. Average monthly temperatures also varies regionally. Mean monthly temperature in January remains below 10-15 Celsius while in north eastern part below 0 Celsius with the exception of far south average of above 15 Celsius. Likewise, mean monthly temperature in July remains below 20 Celsius in north eastern part of the country compared to above 35 Celsius in south of Himalayan foothills (kureshi, K.U., 1997).

2.2.2 Status of forest resources in Pakistan

Pakistan inherited meagre forest resources due to harsh climatic conditions and overexploitation of Natural resources in colonial period. Ever increasing population pose high pressure on natural resources to cope up increasing demand of timber and fuelwood in the country.

The country has diverse and fragile forests. This distinctiveness is based on the range of vegetation it supports. The geographical features of the country enable to support vast variety of plant species, many of which are endemic to this region (Ali & Suleri, 2006a). The (Siddiqui, 1997) classified these forest resources in nine forest types. 1) Littoral and swamp forests; 2) tropical dry deciduous forests; 3) tropical thorn forests; 4) sub-tropical broad-leaved evergreen forests; 5) sub-tropical pine forests; 6) Himalayan moist temperate forests; 7) Himalayan dry temperate forest; 8) sub-alpine forests and 9) Alpine scrubs.

The forestry sector master plan (1992) classified the naturally occurring forests in to four broad categories. 1) coniferous forest in north comprising of 40% of the total forest cover in Pakistan (Ali et al, 2006), 2) Scrub forests, 3) Riverine forests along the Indus river (Siddiqui et al., 2004) and coastal Mangroves on the Indus delta. Federal bureau of statistic report (2005) displays that with 0.05 ha of forest per capita (compared to world average of 1.10 ha), making it one of the lowest ratios of forest cover in the world. According resource assessment 2011 report, Pakistan has a forest cover of 4.47 million hectares which is 5.1% of the total land cover of the country (Bukhari et al., 2012).

Irrespective of Land area, forest cover in each province is different. Table 1, illustrates that Khyber Pakhtunkhwa has highest forest cover (32.7%) followed by Sindh (14.8%), Punjab (12.4%), Balochistan (11.1%) and Gilgit-Baltistan is of 7% of total forest cover (World Bank, 2018). There is difference in national level forest cover report and FAO (2010) report on forests resource assessment. According to FAO (2010), Pakistan had 1.68 million ha of forests in 2010; 1.9 million ha in 2005; 2.1 million ha in 2000, and 2.5 million ha in 1990.

If other wooden lands also included in forest cover, the forest area in 2010 turns to be 3.1 million hectares, still much lower than 4.47 million hectares reported by national sources. The decreasing forest cover also depicted in decreased GDP share. Forestry sector contribution to GDP decreased from 1.2% in 1990 to 0.6% in 2011 (Nazir et al., 2018) which was further declined to 0.4% (Economic survey of Pakistan 2017-18). According to Bukhari et al., (2012), 4.28 million hectares are under natural forest cover while 0.19 million hectares under artificial plantations in Pakistan.

Table 1: Distribution of forests in various provinces and administrative areas

Provinces / administrative areas	Total area	Natural forests	Plantations	Total forest	Forest cover to total area of the Province	Forest cover to total forest in the Province
	(million ha)	(million ha)	(million ha)	(million ha)	%	%
KPK	7.45	1.46	0.004	1.47	19.7	32.7
Punjab	20.54	0.47	0.09	0.56	2.7	12.4
Sindh	14.26	0.59	0.07	0.66	4.6	14.8
Balochistan	35.2	0.5	0	0.5	1.4	11.1
Gilgit-Baltistan	6.98	0.32	0	0.32	4.5	7
FATA	2.73	0.53	0.01	0.54	19.6	11.9
AJ&K	1.18	0.41	0.01	0.42	36.7	9.6
Total	88.43	4.28	0.19	4.47	5.1	100

Source: (Bukhari et al., 2012).

The available data demonstrates that in 2002–2003, the country's total wood demand was 43.76 million m^3, including 12.23 million m^3 for timber and 31.52 million m^3 for fuelwood, whereas the sustainable supply of timber and fuelwood combined was only 14.40 million m^3 . The gap of 29.36 million m3 in supply and demand was fulfilled mainly by overexploiting forest resources and partly through importing paper products and timber (GoP, 2005). Pakistan forest resources are under immense pressure to meet market demand and continuously deteriorating qualitatively and quantitatively because of overexploitation. FAO, 2009 report indicates that Pakistan lost 25% of its natural resources in last two decades. Conifer forests are declining rapidly in natural forests due to high rate of illegal logging. During 1990 to 2005 the natural forests deforested at the rate of 27000 ha per year which was highest in the region.

Forestry in Pakistan is provincial subject as elaborated in National forest policy of Pakistan "Historically, Forestry remained a provincial subject even after independence of Pakistan. In the Constitution of Islamic Republic of Pakistan 1973, Forestry is purely a provincial subject and not impacted by the eighteenth amendments in the Constitution 2010" (GoP, 2015).

IGF office in Islamabad, Pakistan provided platform for sharing forest related information to provinces at national and communicate at international level. Provincial forest departments are responsible for adoption of forest policies and their implementation in their jurisdiction. Provincial Secretary of Forests has the overall responsibility of managing forest resources in the Province. They have central forest secretariats in all Provincial capitals i.e. Lahore, Karachi, Quetta and Peshawar, in Punjab, Sindh, Balochistan and Khyber Pakhtunkhwa respectively. Each forest department has its own planning and monitoring unit, which is responsible for carrying out forest inventories, prepare forest working/management plans. In other words, Provincial forest departments have mandate of planning, implementing and monitoring functions (World bank, 2018).

2.3 Forest policy process and effects

National forest policies are devised to direct and provide guidelines in forestry sector with consensus of interest groups. It usually describes country's commitment towards management of forest resources. In FRA 2010 a "forest policy statement" was defined as "a document that describes the objectives, priorities and means for implementation of the forest policy" (FAO, 2010). Forest policies adoption and implementation have a long history in Pakistan. The first forest policy in British India (Pakistan was a part of British India at that time) was introduced in 1894 with top down, non-participatory preservation of state forests (Shahbaz et al., 2007).

After the creation of Pakistan, mostly forest policies are regime specific. Guidelines for forest policy was provided by central board of forestry established in 1952. First forest policy enacted in 1955 with proactive approach of enhancing forest cover in the country by allocating state lands to forest department, classify forests based on utility, and define objectives of management, and raising irrigated plantations. Planting trees along roads, canals and railways to enhance forest cover. The policy was milestone to enhance forest cover in the country but failed to deal issues related to pine and scrub forests especially stakeholder's rights and grazing issues in state owned and Guzara forests. (Shahbaz et al., 2007).

In spite of having Public office, finance, planning and forest department representatives, this policy failed in monitoring policy process and implementation because the consultation process was confined to forest professionals and administration at later stage (Ahmad et al., 1998).

The second forest policy was introduced in 1962 with proposals of shifting population from hill tracks, accusation of rights of tree removal from public forests, maximize yield, enhance penalties under forest act 1927, transfer of state land to forest departments for afforestation, fire protection measures, raising specific number of trees on agriculture land, encouraging agroforestry and fast-growing short rotation species. The prime focus of policy was to address public forest and maximized the yield and revenues (Shahbaz et al., 2007).

There is improvement in objectives of accusation of rights of tree removal, encouraging agroforestry and planting fast growing species. However, the ambitious objective of shifting population from hill tracks found impractical (Shahbaz et al., 2007). There is least monitoring of raising trees on farmlands. Insufficient budget allocation, non-acquisition of land for forestry purpose at large scale, overambitious targets, increasing demand of wood and wood products as well as capacity issue in implementation of policies triggered in continued forest resource deterioration. Forest policies of 1955 and 1962 were manifestation of top-down non participatory approach in forest sector.

In 1975 the socialistic regime enacted country's third forest policy. This Policy was devised with due consultation of public and private representatives which was a kind of shift from previous top down non participatory approach. It is considered people friendly policy in a way that it accepted Guzara forests (the land of owner managed by forest department) should be managed by owners and forest department may have supervisory role (Hassan, 2001).

The policy also emphasized on synchronization of forestry education with modern needs, extinguishing rights of local people on public forests, prohibition of deforestation of forests, provide funds to raise industrial wood plantations, and technical assistance to farmers (Ahmad et al, 1998). It allows the formation of farmer cooperative societies. The other concrete measure was shifting forest harvesting operations to public sector corporations to circumvent contractor's malpractice. Previously forest harvesting operations were conducted through private contractors (Shahbaz et al., 2007).

The office of Inspector General of Forests in 1977 analysed the situation of existing forest resources and rangelands. It was concluded that increasing population, accelerated soil erosion in watershed areas of Tarbela and Mangla water reservoirs, escalating demand for forest products requires a review of forest policy. Consequently, a consultation process was initiated with provincial forest departments for revision of 1975 forest policy (Ahmad et al., 1998).

Forest policy was approved in 1980. The forest policy of 1980 suggested introduction of fast-growing species on farmlands, decrease in soil erosion in watershed areas, creation of national parks, production of medicinal plants, public participation in afforestation drives and coordination between national and provincial institutions. The policy was well formulated but unable to provide the guidelines to achieve these objectives. It also failed to promulgate bird's directive initiative into national policies. The figure 6, represents the timeline of forest policies adopted and implemented in Pakistan.

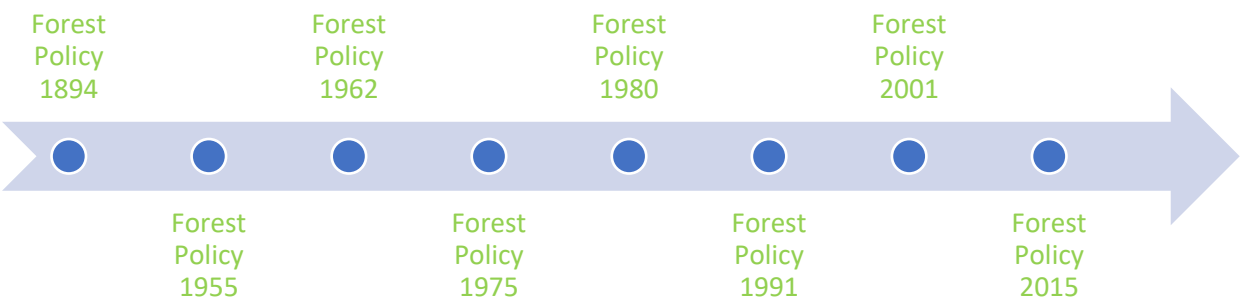


Figure 6: Timeline of forest policies in Pakistan

International seminar on Pakistan's Forest Policy hosted by Inspector general of forests office with collaboration of USAID and FAO in 1989 in Karachi provided the base for 1991 forest policy. Working groups were asked to provide their input on socio-economic, legislation, international linkages, financial and political support aspects of forest sector. Their endorsements conferred with provincial forest departments and cross sectoral contributions were also cogitated. The farmer associations were also taken in confidence considering their suggestions.

The forest policy was formulated with apposite consultation with non-governmental organisations and donor agencies to cope with the challenges faced by the state in forests sector (Ahmad et al., 1998). To meet the environmental challenges, increasing timber, fuelwood and fodder demand, it was suggested that the forest area of country should be increased from 5.4% to 10% by 2006. Social forestry programs would be promoted, and forest diversity would be conserved (Shahbaz et al., 2007).

Financial assistance should be provided for management of national parks and nationally important species. Encouraged rehabilitation of degraded forest lands. Various incentives are given to promote afforestation of degraded, waterlogged and marginal farmlands. It included provision of low-cost saplings to the farmers, long term low interest credits for block plantations and study tours for progressive farmers. Furthermore, arranging extension programs, involving NGOs and introducing insurance schemes (Ahmad et al., 1998).

Critique was of the view that this policy gave vast discretionary powers to the officials of forest departments in determining what they deemed "reasonable forest requirement." This policy was also perceived as reflecting "the colonial form of governance these laws and institutional structures were meant to increasing the government's income, depriving people of their rights on natural resources, and suppressing the people's aspirations through centralization of bureaucratic powers" (SAFI, 2000). 1991 forest policy sets goals i.e. multiple use of forest resources, socially inclusive and environment friendly, although it remained vague about the means for achieving these objectives (Ahmed et al., 1998).

Sixth forest policy enforced in 2001. The forest policy 2001 emphasized on integrated management of RNR i.e. forests, rangelands, watersheds, wildlife and biodiversity with public participation for sustainable development of RNR of Pakistan. The policy addressed to eradicate causes of RNR depletion through stakeholder's engagement. It encouraged the formulation and implementation provincial and local forest policies (Shahbaz et al., 2007). The goal of this policy was to foster the sustainable development of RNR of Pakistan, for the maintenance and

rehabilitation of its environment and the enhancement of the sustainable livelihoods of its rural masses especially women, children and other deprived groups.

The policy provided elements of rehabilitation and sustainable development of RNR i.e. reducing impact of socio-economic causes, reducing political interference, renovating and invigorating the institutions of RNR, supporting local governments, policies for fragile ecosystem, planting trees and fodder on farmlands and preservation of relict and unique forests (GoP, 2001). This policy discussed almost all aspects of forestry and provided way forwarded to deal the issues for sustainable development of RNR of Pakistan. However, FAO global forest resource assessment 2010 report, illustrated that forest area was decreasing at the rate of 43000 hectares per year in Pakistan from 2000 to 2010. It implied that policy was paper parked. Shahbaz et al., (2007) also pointed out that at one hand policy encouraged provincial governments for creation of protected forest areas on the other it also promoted devising mechanism for management of protected areas with community collaboration. Provinces and local governments also failed to formulate their own forest policies except KPK province.

3 Materials

3.1 United Nations Forum of Forests and UNSPF 2017-30

3.1.1 United Nations Forum of Forests

IPF from 1995 to 1997 and IFF from 1997 to 2000 and later on the UNFF under United Nations Functional Commission on Sustainable Development provided international community the platform to discuss forest related issues and stipulate guidelines for sustainable management of forest resources. IPF and IFF identified 270 proposal for sustainable management of forests which were not legally binding, but each country deemed to conduct national assessment and devise plans for the implementation of these proposals (Muhammad et al., 2008).

The UNFF is subsidiary of UNECOSOC. In its first session in 2001 disclosed the objectives of international process on forests "The main objective of the international arrangement on forests is to promote the management, conservation and sustainable development of all types of forests and to strengthen long-term political commitment to this end"(UNFF, 2001). Later on in sixth session UNFF approved clearly defined four objectives of (a) reverse forest loss, (b) enhanced forest based benefits, (c) increased sustainably managed forests and (d) mobilization of financial resources (UNFF, 2006).

While pursuing Forest objectives, recognizing forest importance in providing ecosystem services i.e. Provisioning, supporting, regulating and cultural (MEA, 2005) and established role of forest as carbon sink in climate change mitigation (Kalaba et al., 2014), UNFF in its 12th session adopted UNSPF 2017-2030. It provides framework for management of all types of forests and trees outside the forests and reduce deforestation and forest degradation in coherence with other forest related processes. The UNSPF includes six global forest goals and associated targets to be achieved by 2030. These goals are in coherence with horizontal and vertical, intra and cross sectoral international forest policies (UNGA, 2017). The goals are described as under;

Goal: I. Reverse the loss of forest cover worldwide through SFM, including protection, restoration, afforestation and reforestation, and increase efforts to prevent forest degradation and contribute to the global effort of addressing climate change.

Goal: II. Enhance forest-based economic, social and environmental benefits, including by improving the livelihoods of forest dependent people.

Goal: III. Increase significantly the area of protected forests worldwide and other areas of sustainably managed forests, as well as the proportion of forest products from sustainably managed forests.

Goal: IV. Mobilize significantly increased, new and additional financial resources from all sources for the implementation of SFM and strengthen scientific and technical cooperation and partnerships.

Goal: V. Promote governance frameworks to implement SFM, including through the UN Forest Instrument, and enhance the contribution of forests to the 2030 Agenda.

Goal: VI. Enhance cooperation, coordination, coherence and synergies on forest-related issues at all levels, including within the UN System and across CPF member organizations, as well as across sectors and relevant stakeholders.

3.1.2 UNSPF policy document

United Nations strategic plan for forest document was downloaded using web search. The UNSPF document file downloaded from United Nations Forum on Forest website (https://documents-dds-ny.un.org/doc/UNDOC/GEN/N17/184/62/PDF/N1718462.pdf?OpenElement).

The figure 7 describes the index of United Nation Strategic Plan for forest.

Figure 7 Representing index of United Nations strategic plan for forests document

3.2 National forest policy document

National forest policy 2015 emphasizes on conservation of forest resources, increasing forest cover on farmlands through community participation and meeting international obligations and agreements. The policy also emphasized on developing provincial forest policies under the guidelines provided in national forest policy (Word bank, 2018). The National Forest Policy 2015 goal is "Expansion of national coverage of forests, protected areas, natural habitats and green areas for restoration of ecological functions and maximizing economic benefits while meeting Pakistan's obligations to international agreements related to forests" and Policy objectives (GoP, 2015) are given below;

I. Enhancing public awareness on economic, social, ecological and cultural values of forests
II. Implementing a national level mass afforestation program to expand and maintain forest coverage to meet international standards.
III. Controlling deforestation through regulating movement of timber and inter-provincial trade of timber.
IV. Establishing and managing protected areas and networking through ecological corridors.
V. Reducing carbon footprints of energy and economic sector program
VI. Facilitating implementation of international conventions and agreements related to forestry, biodiversity and climate change.
VII. Promoting standardized and harmonized scientific planning of forests, research and education.

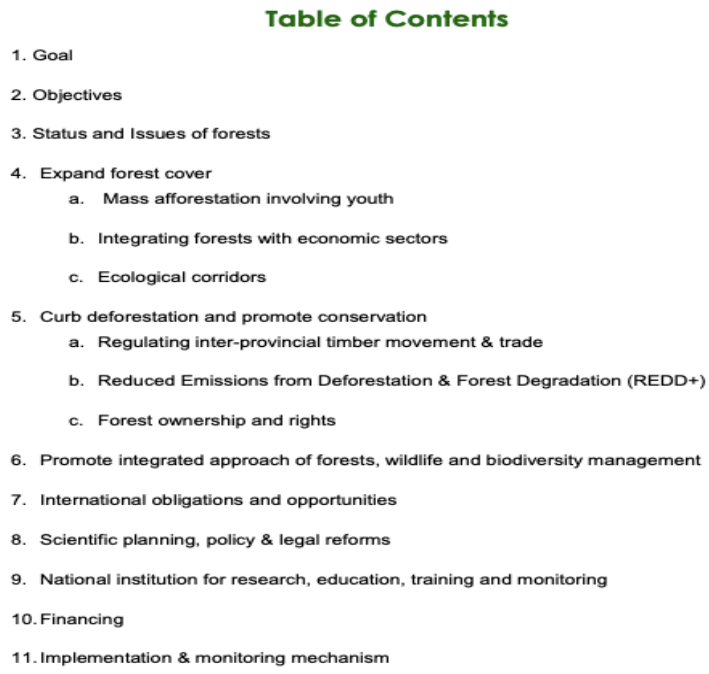


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Figure 8 Representing index of national forest policy document

The figure 8 represents the Index of National forest policy document. While National Forest Policy of Pakistan document was downloaded from Ministry of Climate Change Pakistan (MOCC) website (http://www.mocc.gov.pk/moclc/userfiles1/file/National%20Forest%20Policy%202015%20(9-1-17).pdf). The table 2 describes the characteristics of UNSPF and NFPP policy documents. It provides us the information about the document status, publication year, page count and word count.

Table 2: Forest policy documents and characteristics

Document name	Status	Publication yea	Pages count	Words count
United Nations strategic plan for forests	Final	2017	24	9726
National Forest Policy of Pakistan	Final	2015	14	3713

4 Methods

The capacity of forest policy vertical transfer has been analyzed on the bases of two different methodological approaches, distinct but at the same time integrated (Figure 9). The first approach performed content analysis which is extensively used in analyzing textual contents (Neuman, 2006). This is articulated in two steps, such are:

- Contents analysis of forest policy documents produced at international (UNSPF 2017-2030) and at national level (NFPP 2015) using the "Yoshikoder" software developed for textual contents analysis (Neuman, 2006; Lowe, 2004);

- Logical framework of key terms selection for the content analysis. Analyzing main documents under investigation in order to identify key terms representative of relevant thematic areas;

In the second part we elaborated analysis of implementation of these policies at national and regional level;

- Analysis of forest policy actions implemented in Pakistan territory in response to the objectives of the international forest policy. For analysis data have been obtained from questionnaires submitted to of Forest Office functionaries and using data base. The country forest assessment report 2015 was also consulted to collect data for analysis;

4.1 Content analysis

The content analysis is widely used methodology for textual data analysis (Atela et al, 2016) (Yurdakul et al, 2017) (Sadath et al., 2012). Kerlinger (1986) defined the Content analysis as “the method of studying and analysing systematic, objective and quantitative manner for the purpose of measuring variables”. Content analysis is the most apposite way of revealing the precise, objectively significant, text, word or symbol from a large volume of text (Neuman, 2006).

Sarah et al 2016 used content analysis to trace out influence of international institutions on national forest policies in Argentina. Giessen et al., (2016) applied content analysis to study the distributive effect of sustainable forest management policies on power among domestic and foreign bureaucracies in Bangladesh.

Sadath et al., (2012) employed content analysis to investigate policy change in last two decades in Bangladesh. Content analysis applied to examine coherence in Nepal’s climate and forest policies and discussed the factors hindering effective implementation (Ranabhat et al., 2018) . Erol et al., (2017)

applied content analysis to figure out the importance of rural development in forestry sector and Turkish forest policies.

Figure 9: F*low chart elaborating the steps followed in methodology*

Basic objective of content analysis is to convert the raw content into scientifically presentable data which can be used for analysis and interpretation (Stempel, 1989). The policy documents are analyzed to determine the relative range of key terms used. "The analysis is based on the hypothesis that the frequency of occurrence of a key term in a document is related to the importance of the topic in the document".

The content analysis is reliable method in analysing large text documents. It provides guidelines for systematically coding of text and illustrating interpretations (FAO, 2012). UNFF goals considered as thematic areas and terms focused on these thematic areas as key terms. Frequencies of key terms in policy document described the significance of terms in the document (FAO, 2012). Content analysis covered key terms used in united nations strategic plan on forests in six thematic areas of UNFF goals.

While, thematic elements and key terms are defined the question arises what kind of unit of content will be used in analysis? The unit of analysis is the smallest unit of content that is coded into the category. The unit of analysis could be a single word, letter, theme or a story. There are two types of unit of analysis: 1) Recording units in which occurrence of key words counted for analysis. 2) Context units in which the whole context of the statement is considered for recording unit (Parsad, B.D. 2008). We used recording units for analysis to access and compare the frequency of key terminology used in United Nations Strategic Plan on forests and National Forests Policy of Pakistan.

4.2 Logical Framework for key terms selection

In this research, the Yoshikoder software used for content analysis. The Yoshikoder requires main thematic area and sub-categories as input for coding in software. We considered sub-categories as key terms used in UNSPF policy document. We adopted these key terms from United Nations document. Some of the key terms have overlapping for different thematic areas e.g. key term "economic" can be used under thematic areas of Enhanced forest-based benefits or Increased sustainable forest management. The key term "illegal logging" can be used under thematic areas of Reverse the forest cover loss or promote forest governance. Therefore, logical framework is required to enhance the probability coding of key terms under proper thematic area in content analysis.

We considered six forest goals as six thematic areas for sustainable development. Thematic areas are:

1. Reverse the forest cover loss worldwide
2. Enhanced forest-based benefits
3. Increased sustainable forest management
4. Mobilize financial resources
5. Promote governance
6. Enhanced coordination at all levels

For these, six thematic areas we have key terms relevant to thematic areas. With the questionnaire, we investigated how did the forestry professionals give preference to key terms for different thematic areas. We selected 29 key terms for six thematic areas and devised a questionnaire in excel file for evaluation of key terms against each thematic area. Each key term against thematic areas have given value from 0 to 5. Where 0 value shows irrelevance of key term with that specific thematic area while value 5 indicates maximum preference for thematic area. In July 2019, the questionnaire distributed among twenty-six forestry students and academic

professors by email. They were approached time and again by email to get feedback. Finally, we received twelve replies in three weeks. The figure in Appendix 3 represents the accumulative outcome of all the feedbacks received.

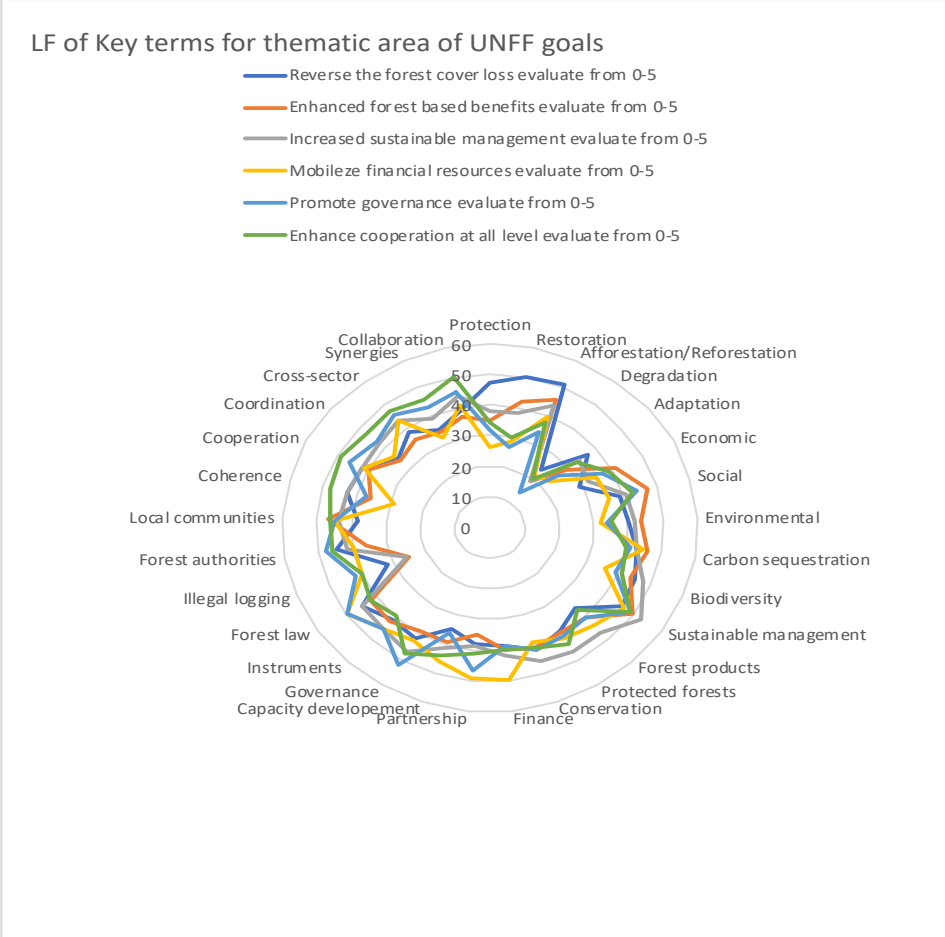


Figure 10 showing the feedback of respondent on Logical Framework of key terms selection for thematic areas of UNFF goals

On the basis of feedback, a sunburst chart (fig 10) was devised to display the logical framework of key terms preferences given by the respondents for each thematic areas.

4.3 Yoshikoder Software:

The Yoshikoder software is an open source widely used desktop tool for performing computer aided basic content analysis. The software uses text files as input files, while selecting document in input files we can get report about frequencies of words used in document (Lowe, 2004a). To reduce the effort, this software has option to select main category (thematic area) under which we can select sub-categories (key terms). In each sub-category we have add pattern option to describe synonym words or terms under same category as you can see in figure 11.

By assigning main, sub-categories and patterns to each sub-category as mentioned above, we can get the report about frequency of each sub-category in selected document just clicking report option on toolbar.

One of the features of this software is that, it offered concordance option. Concordance is an alphabetical list of the principal words used in a book or body of work, listing every instance of each word with its immediate context. To avoid terms used without context we obtained concordance report to have context of terms used and eliminated those used out of context (Lowe, 2004a). The figure 11 shows the interface of the software used. To perform content analysis, we used UNSPF and NFPP documents. Both policy documents were in PDF format. We converted

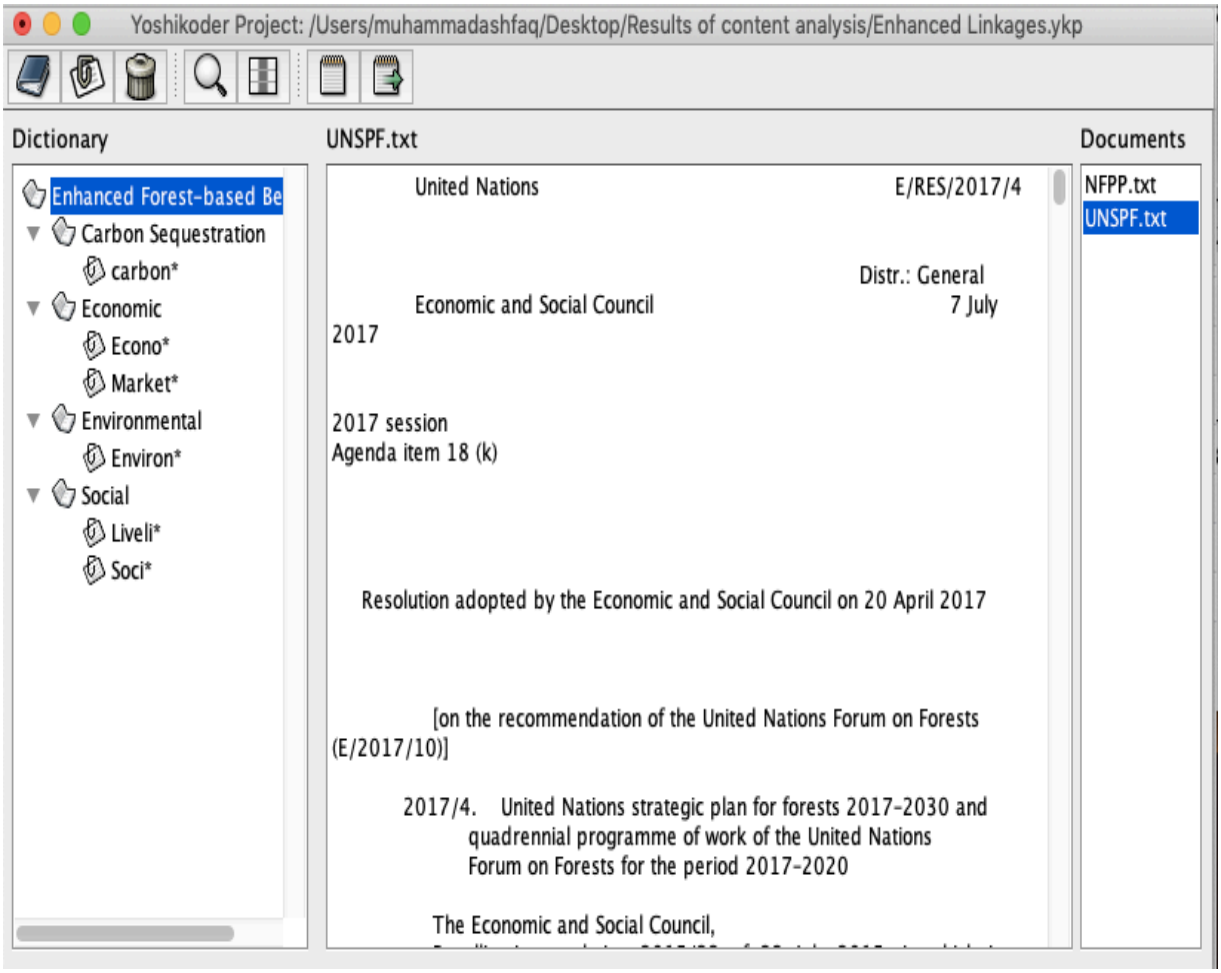


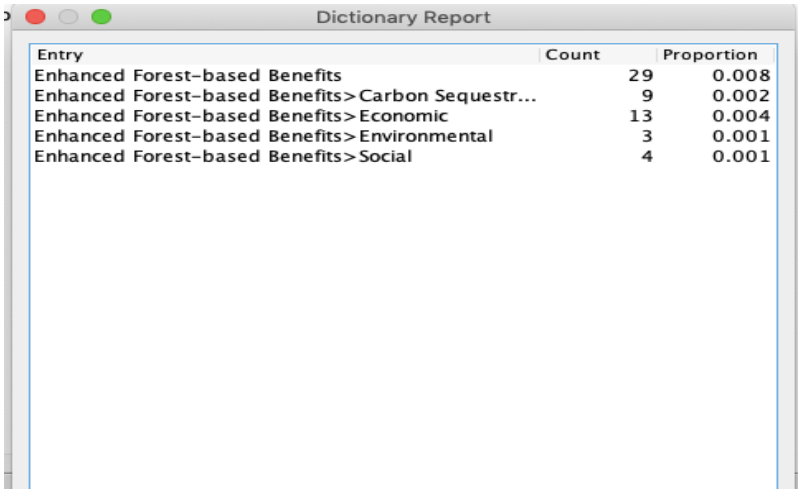
Figure 11 Showing Yoshikoder software interface

them into text format using "Aconvert.com" website to make them compatible to the in Yoshikoder software. By using this website, you can convert selected files into desired format and can save in desire destination. The UNSPF policy document file uploaded in Yoshikoder to perform content analysis.

We described thematic area (Enhanced forest-based benefits), key terms (carbon sequestration, economic, environmental and social) and patterns (econo* and market*) for key term economic

for thematic area as you can see in figure 11. We selected Report option on toolbar where we chose apply dictionary on current document option.

This has given us frequencies of selected key terms of thematic area in UNSPF document as you can see in figure 12. We extracted the results and Tabulated each entry in Microsoft excel. We selected each key term and prepared concordance report by using concordance option in toolbar to avoid counting of key term used out of context that made our results more reliable. Following concordance report necessary corrections were made in previous results.



The software provides us the information regarding frequencies of key terms, document pair comparison and relative risk. The Above procedure was followed for each of six thematic areas to have frequencies of key terms, key term per page, proportion and risk ratio for UNSPF Policy document. The same procedure was followed to obtain value of parameters in NFPP document as well. In this way, we tabulated frequencies of key terms, key terms per page, proportion and risk ratio in six thematic areas from UNSPF and NFPP policy documents to analyze the level of coherence.

The terminology and formulae to compute frequencies of key terms, proportion, relative risk and key term per page are explained in following lines. The frequency is the number of times the word has been repeated in the document. The document pair comparison describes relative number of times the term has been repeated given the total number of words in the document (Lowe, 2004b).

In software it has been designated as proportion. The proportion gives us the relative share of the key term in the document. we can formulate it as under;

$$P = f/wc$$

Where,

P: proportion of key term in document

f: frequency of key term in the document

wc: total word count of the document

Relative risk or risk ratio has become one of the standard measures in research. It is defined as the multiple of risk of the outcome in one group compared with another group and is expressed as risk ratio in cohort studies (Zhang & Yu, 1998).

$$RR = \frac{P_{nfpp}}{P_{unspf}}$$

Where,

RR = Relative risk or Risk ratio

P_{nfpp} = Proportion or document pair comparison of NFPP document

P_{unspf} = Proportion or document pair comparison of UNSPF document

The Yoshikoder offers a statistical comparison report that computes risk ratio estimates and confidence intervals for each key term. Risk ratio exhibit document pair comparison of NFPP to UNSPF policy document. The risk ratio is useful to have a measure of reliability. The value of risk ratio >1 indicates high level of coherence between NFPP to UNSPF document while 1< shows lower level of coherence between NFPP and UNSPF document (Lowe, 2004b). FAO (2012) explained another parameter key term per page. It is the frequency of key term found in a document divided by the number of pages of that document in order to make the results better comparable between documents of different lengths. We devised the criteria for describing the level of coherence. The table 3 represents the criteria for the measuring the level of coherence between NFPP and UNSPF policy document is describe below.

Table 3 Showing the criteria for coherence of relative proportion and key term per page

Criteria for coherence of relative proportion and key term/page					
Description	very high	high	low	very low	non-coherent
value for relative proportion, key term/ page	>0.8	0.6-0.79	0.4-0.59	0.2-0.39	0-0.19

4.4 Analysis of UNFF goals implemented in Pakistan

In this part, we explained the procedure adopted for data collection and analysis to achieve UNFF goals as a result of implementation of forest policies at the National and Provincial level. Keeping in view of the content of UNFF goals, several questionnaires were designed see Appendix 8.1 to 8.4. The mixed quantitative and qualitative questionnaires were prepared following the guidelines provided for monitoring and assessment of UNFF goals by (UNFF, 2018) and FAO (2015) to collect country level data for global assessment of forest resources (FAO, 2105).

These questionnaires were developed to collect data regarding actions taken to reverse the forest loss, enhance forest-based benefits, increase sustainable forest management, mobilize financial resources, promote governance and enhanced linkages. For reverse the forest loss we collected the data on total forest area, afforested/reforested area, restored, deforested, total change in forested area and net change in forest area at provincial and national level in state owned forests. For enhanced forest-based benefits goal, we collected data of number of heads employed by forest department, social, economic and environmental benefits provided by the state forests. For increased sustainable forest management goal, we collected data on total area of forests, protected forest areas, reserved forest areas, areas under guzara[1] forests, areas under section 38[2] forests, areas under private forests and forest revenues and product from sustainably managed forest. For mobilization of financial resources goal, we collected data on resources allocated by international institutions, government at national level and NGOs.

The questionnaires devised to collect provincial and national level data for the year 2010 and 2018 which enabled us to compare the scenario before and after implementation of international and national forest policies. Where the original data was not available, we used linear interpolation method to assess the parameters as recommended in FAO country forest resource assessment report 2015. The formula used in calculation is given in appendix: 8.5. The provincial offices of chief conservator of monitoring and planning were requested to provide required data on given questionnaires for the year 2018 mentioned in appendix 8.1-8.4. The questionnaire distributed through email in May 2019. The focal person's in the respective offices approached time and again. The provincial offices provided the relevant available data on prescribed

[1] "guzara forests": means protected wasteland of the villages set aside at the time of regular settlement for meeting the requirements of landowners and right holders, in the areas comprising the Districts of Haripur, Abbottabad, Mansehra, Kohistan and Batagram or elsewhere in the Province or which may be declared as such under this Ordinance or the rules made thereunder; KPK Forest ordinance 2002.

[2] section 38 forests: If the owner of any wasteland other than guzara forests, or if there be more than one owner, the owners of shares therein amounting in the aggregate to at least two-third thereof, with a view to the formation, protection, conservation, management or sustainable development of forests thereon; KPK forest ordinance 2002.

questionnaires at the end of July 2019. The map in figure 13 shows the territorial boundaries of provinces (Punjab, Sindh, Balochistan and Khyber Pakhtunkhwa).

After receiving relevant information, we compiled it for further analysis. Comparative analysis is commonly used to compare the state of forest, forest policies, and state of governance in countries (Andersson et al., 2005; Hellstorm, E., 2001; Lambini, C, K. et al., 2013). We employed comparative analysis to asses level of implementation of forest policies between 2010 and 2018. Comparative analysis of national level data was performed to interpret the results. The results obtained from content analysis and comparative analysis of data explained in next section.

Figure 13 Provincial map of Pakistan source: https://geology.com/world/pakistan-satellite-image.shtml

5 Results

5.1 Results of Content analysis

5.1.1 Goal: 1 Reverse of forest cover loss

Reversal of forest cover loss is one of the six goals in the strategic plan adopted by UN ECOSOC through resolution 2017/4. The protection of existing resources, reforestation and combating deforestation can play pivotal role in enhancement of forest cover. The government lead reforestation policies and measures to combat deforestation in South Korea helped in reverse of forest cover loss. During 1955 to 1980 the forest cover in South Kora enhanced forest cover from 36% to 65% (Soo et al., 2012).

The south Korea achieved forest cover restoration through National Greening Program (Park & Lee, 2014). The reforestation, afforestation and agroforestry along with combating deforestation drives, facilitated India in restoration of forest cover loss (Singh et al., 2017). Recover the forest cover loss goal will help in retrieving the areas previously forested and increase the overall forest cover. This will also contribute towards sustainable forest management and climate change mitigation.

The content analysis of UNSPF and NFPP documents provided us significant results. The software, Yoshikoder provided for each document, the values for each key term, for the following indicators the frequencies of key terms, Proportion and Risk Ratio. The content analysis results are shown in table 4. The frequencies of key terms “protection”, “restoration”, afforestation”, “deforestation” and “adaptation” in UNSPF document are 8, 5, 9, 20 and 7 while 9, 4, 16, 14, 1 in NFPP document respectively.

Table 4: Results of content analysis on reverse of forest cover loss

Content Analysis Results on Enhanced Forest-based Benefits							
	UNSPF			NFPP			
Key terms	Frequencies	Proportion	Key terms/page	Frequencies	Proportion	Key terms/page	Risk Ratio
Protection	8	0.001	0.33	9	0.003	0.64	2.95
Restoration	5	0.001	0.21	4	0.001	0.29	2.10
Afforestation	9	0.001	0.38	16	0.004	1.14	4.66
Deforestation	20	0.002	0.83	14	0.004	1.00	1.83
Adaptation	7	0.001	0.29	1	0	0.07	0.38
Total	49	0.006	2.04	44	0.012	3.14	2.35

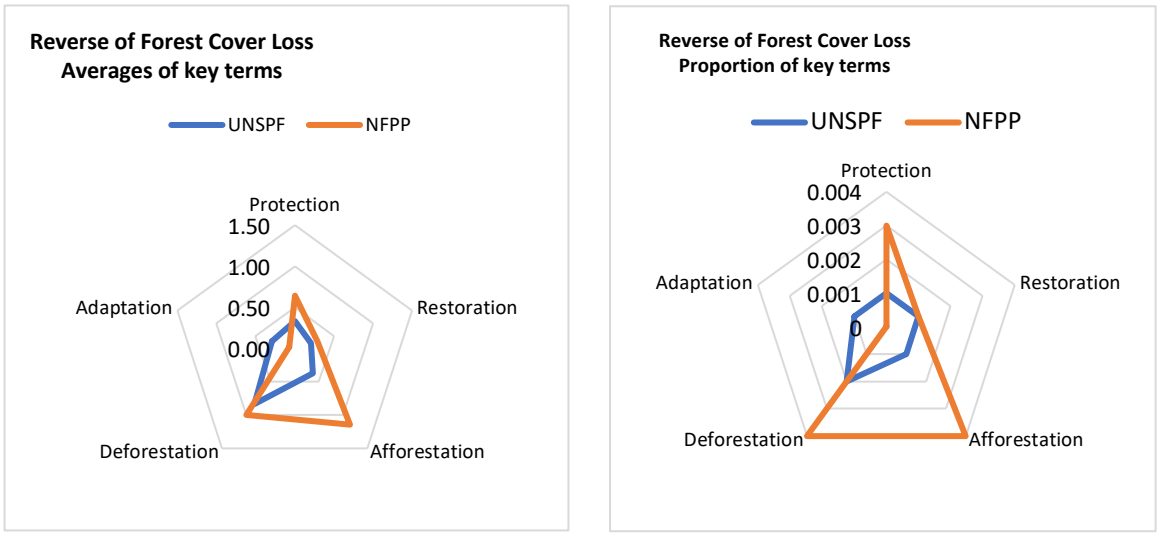
UNSPF: United Nations Strategic Plan for Forests

NFPP: National Forest Policy of Pakistan

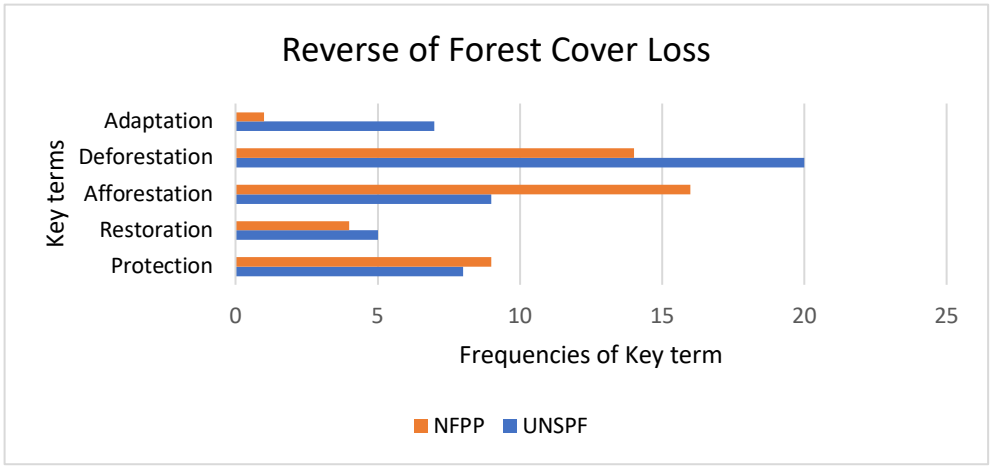
The values of key term per page for NFPP and UNSPF documents in table 4 portrays relative importance given to each term in the document. the values for “protection”, “restoration”, “afforestation”, “deforestation” indicate that there is very high coherence between NFPP and UNSPF policy document. while comparison of term “adaptation” shows very low coherence

between two documents. The results of analysis key terms per page displays that NFPP have given 1.53 times more value than UNSPF document.

In table 4, we observed the proportion of each key term in their respective documents. The term "deforestation" has highest proportion of 0.002 compared to "protection", "restoration", "afforestation/reforestation" and "adaptation" having 0.001 in UNSPF document. The NFPP policy document shows 0.004 for "deforestation" and "afforestation", 0.003 for "protection", 0.001 for "restoration" and 0 for "adaptation". The sum of Proportion of key terms in each document indicated that NFPP document with proportion of 0.012 had given more weightage to achieve reverse of forest cover loss goal.



(a) *(b)*



(c)

Figure 14 (a) Represents the comparison of proportion of key terms, (b) the average of key terms per page and (c) the frequencies of key terms used in UNSPF and NFPP policy document

The risk ratios of 2.95, 2.10, 4.66 and 1.83 display that NFPP and UNSPF documents have very high coherence in "protection", "restoration", "afforestation" and "deforestation".

While low coherence for "adaptation" with 0.38 risk ratio. The chart in figure 14 (a) represents the comparison of proportion of key terms, (b) represents the average of key terms per page and (c) denotes the frequencies of key terms used in UNSPF and NFPP policy documents to achieve reverse the forest cover goal. The results of content analysis are evident of high level of policy coherence between NFPP and UNSPF policy document.

In UNSPF policy document as per analysis and frequencies shown in figure: 14 depicted that policy makers emphasized on "afforestation" and controlling "deforestation" to increase the forest cover while an average weightage to restoration and adaptation efforts. While in National forest policy more emphasize was on "afforestation", reduce "deforestation" and "protection" to reverse the forest cover loss. It is important to notice that policy makers at National level has given low or no importance to adaptation efforts which is one of the key areas in managing forest in climate change scenario.

5.1.2 Goal: 2 Enhanced benefits from forest resources

The content analysis results in table 5 illustrates the interest of policy makers to enhance the forest-based benefits from natural resources on sustainable bases. The frequencies of key terms, proportion, averages of key terms per page and risk ratios in documents are indicative of their importance to achieve UNSPF goal 2. The key terms "economic", "social", "environmental", "carbon sequestration" has frequencies 15, 13, 15 and 2 in UNSPF document. while 7, 4, 3 and 7 in NFPP document respectively.

Table 5: Results of content analysis of NFPP and UNSPF policy documents for enhanced forest-based benefits

Content Analysis Results on Enhanced Forest-based Benefits							
	UNSPF			NFPP			
Key terms	Frequencies	Proportion	Key terms/page	Frequencies	Proportion	Key terms/page	Risk Ratio
Economic	15	0.002	0.63	7	0.002	0.50	1.22
Social	13	0.001	0.54	4	0.001	0.29	0.80
Environmental	15	0.002	0.63	3	0.001	0.21	0.52
Carbon sequestration	2	0.000	0.08	7	0.002	0.50	9.14
Total	45	0.005	1.88	21	0.006	1.50	1.22

If we analyze in key terms per page, it displays that there is very high coherence for "carbon sequestration" and "economic" between NFPP and UNSPF policy document while low coherence for "social and "environmental". The sum of the averages 1.50 and 1.88 demonstrate very high coherence between both documents. If we compare the proportion of key terms in documents, it

elucidates that NFPP and UNSPF policy document have given almost equal importance to achieve enhanced forest-based benefits goal.

The NFPP document has given very high significance to "carbon sequestration". The risk ratios of each key term also stipulate us intuition to envisage the coherence between policy documents. RR of 1.22, and 9.14 for "economic" and "carbon sequestration" category demonstrates very high

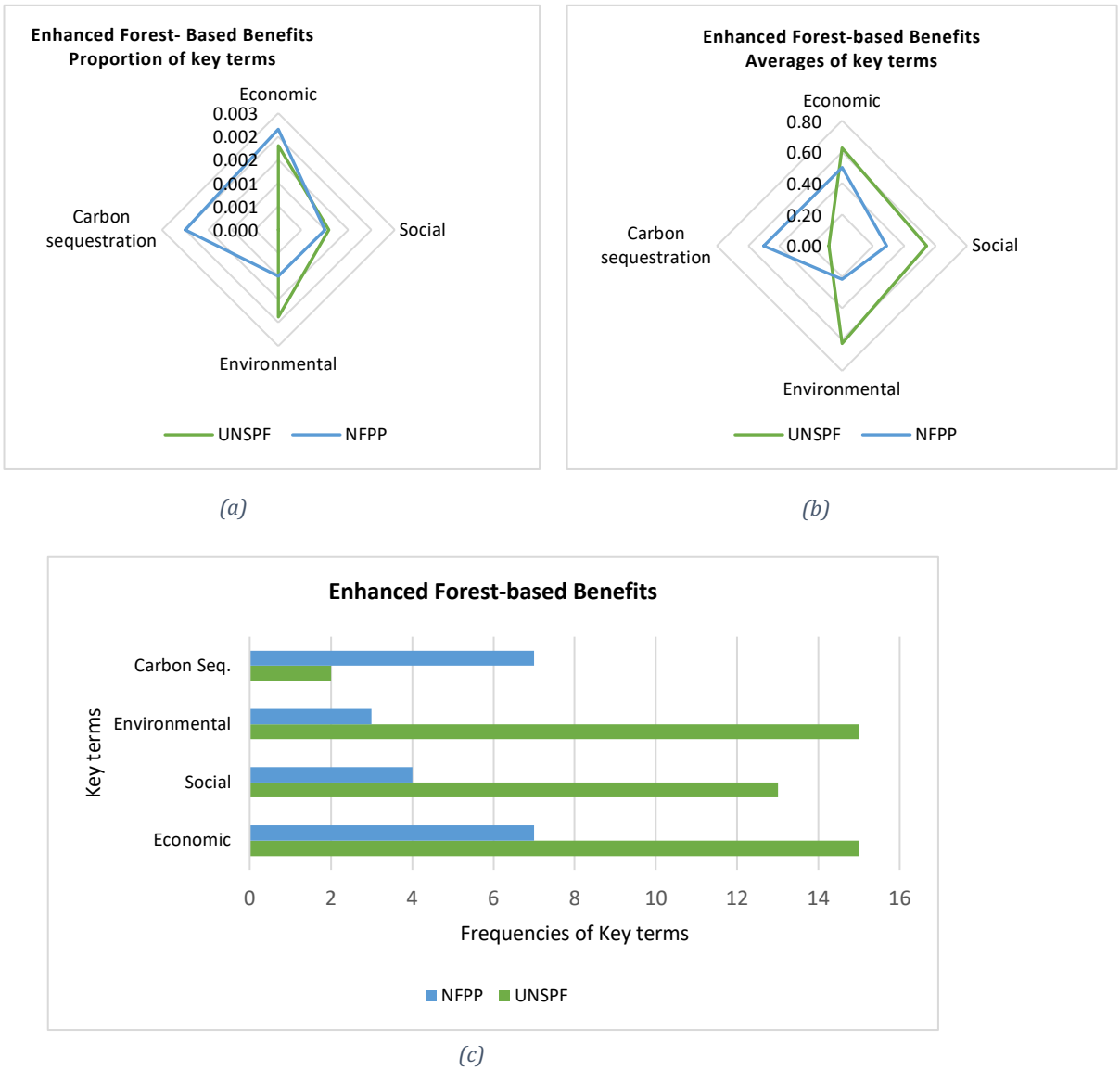


Figure 15 (a) Represents the comparison of proportion of key terms, (b) the average of key terms per page and (c) the frequencies of key terms used in UNSPF and NFPP policy document

coherence. While "social" with RR value 0.80 represents low coherence. The chart in figure 15 (a) represents the comparison of proportion of key terms, (b) represents the average of key terms per page and (c) denotes the frequencies of key terms used in UNSPF and NFPP policy documents to achieve enhanced forest-based benefits.

It is evident from the figure 15 that UNSPF policy document accentuated more on "economic", "social" and "environmental" terms compared to NFPP documents to achieve Enhanced forest-

based benefits objective. while, Pakistan national policy makers have given very high importance to carbon sequestration in comparison of UNSPF policy document.

5.1.3 Goal: 3 Increased sustainable forest management

Increased sustainable forest management is the third key thematic area of UNSPF goals. The sustainable forest management can be attained by increasing biodiversity, forest production, protection of resources and adopting conservation measures. The content analysis to access increase in sustainably managed forests provided us substantial outcomes. The table 6, embodies the results of content analysis of UNSPF and NFPP policy document for increased sustainable forest management goal. The analysis results demonstrate comparison of the frequencies of key terms used in each document, proportion of key terms, averages of key terms per page and risk ratio. The frequencies, proportion and average of key terms used in each document are indication of their relevant importance for policy makers to achieve this goal.

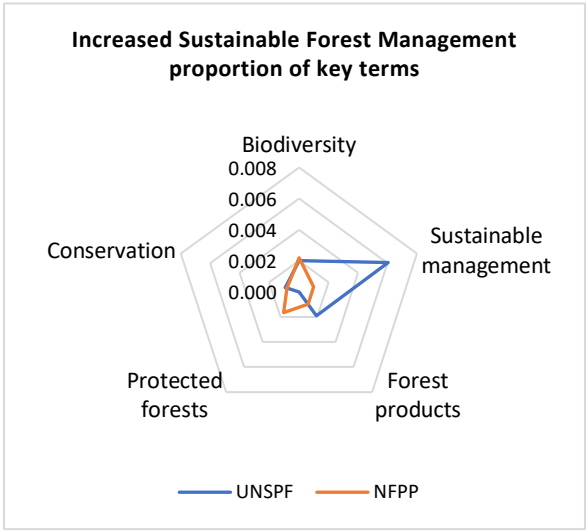
Table 6 Showing content analysis results of UNSPF and NFPP documents for increased sustainable forest management goals

Content Analysis Results on Increased Sustainably Managed Forests Theme							
	UNSPF			NFPP			
Key terms	Frequencies	Proportion	Key terms/page	Frequencies	Proportion	Key terms/page	Risk Ratio
Biodiversity	15	0.002	0.63	8	0.002	0.57	1.39
Sustainable management	58	0.006	2.42	5	0.001	0.36	0.23
Forest products	16	0.002	0.67	2	0.001	0.14	0.33
Protected forests	3	0.000	0.13	5	0.002	0.36	4.35
Conservation	11	0.001	0.46	4	0.001	0.29	0.95
Total	103	0.011	4.29	24	0.007	1.71	0.61

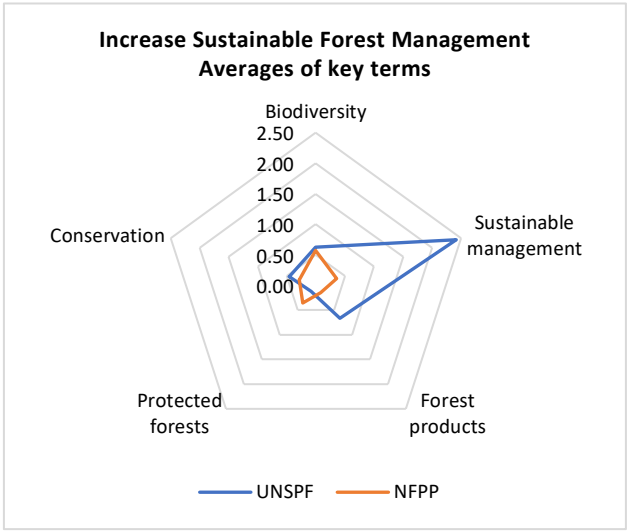
The key terms “biodiversity”, “sustainable management”, “forest products”, “protected forests”, “conservation” has frequencies 15, 58, 16, 3, and 11 in UNSPF document while 8, 5, 2, 5 and 4 in NFPP document respectively. If we have look on key terms used per page it indicates that NFPP document have very high coherence in “biodiversity”, “forest products” and “protected forests”, high for “conservation” low coherence for “protected forests” and non-coherent in “sustainable management”. The sum of key terms per page 1.71 for NFPP and 4.29 UNSPF policy document represents of low coherence between NFPP and UNSPF policy document.

The table 6, presents us the details of the proportion of each key term in UNSPF and NFPP policy documents. The comparison of values of key terms “biodiversity” and “conservation” displays that there is very high coherence between NFPP and UNSPF policy document in achieving increased sustainable forest management goal. The term “forest products” shows low coherence, while non coherent for term “sustainable management”. The term “protected forests” in NFPP have higher proportion than UNSPF document which indicates the national policy makers interested in increased protection of forests for achieving sustainable goals. The risk ratios in

table 5, exhibit document pair comparison of NFPP to UNSPF policy document. The values 1.39, 0.23, 0.33, 4.35 and 0.95 for key terms "biodiversity", "sustainable management", "forest products", "protected forest" and "conservation" respectively. The terms "biodiversity", and protected forests" in NFPP are consistently used and have very high coherence with UNSPF policy document. The chart in figure 16 (a) represents the comparison of proportion of key terms, (b) represents the average of key terms per page and (c) denotes the frequencies of key terms used



(a)



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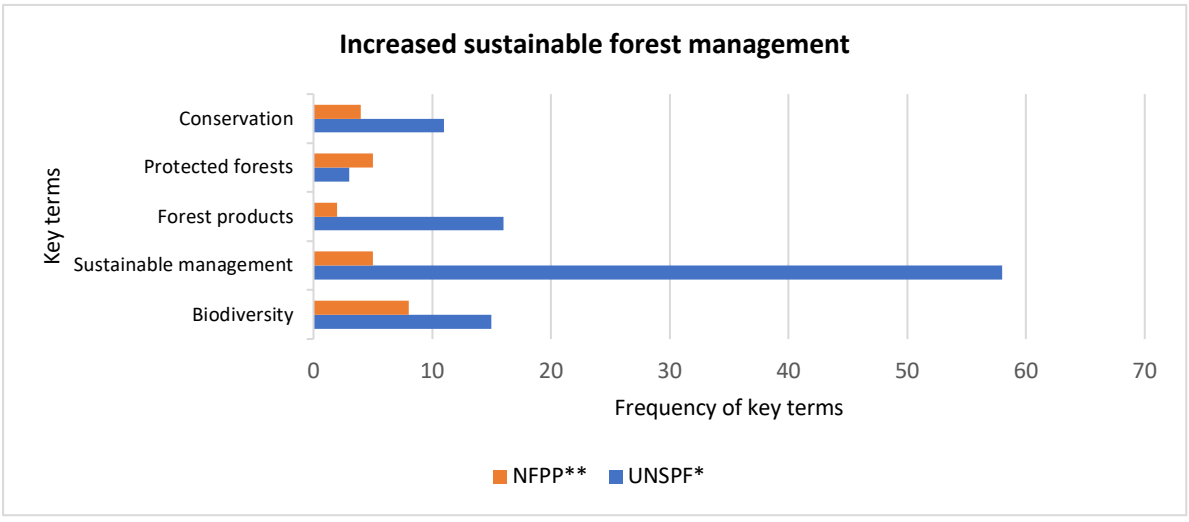


(c)

Figure 16 (a) Represents the comparison of proportion of key terms, (b) the average of key terms per page and (c) the frequencies of key terms used in UNSPF and NFPP policy document.

in UNSPF and NFPP policy documents to achieve increased sustainable forest management goal. The policy makers while devising UNSPF goals emphasized on sustainable management, biodiversity, production of forest and conservation for achieving this goal while analysis results from NFPP policy document are evident that the policy makers focused more on forest protection and biodiversity to achieve sustainable forest management goal.

The comparison of the values for proportion of key terms, averages of key terms and risk ratio in table 6, demonstrate that key terms "biodiversity", "protected forests" and "conservation" have higher coherence. While comparison of values of key term "sustainable management" shows there is very low coherence between NFPP and UNSPF policy document. The comparative results of total sum of key terms used, proportion of key terms, averages of key terms per page and risk ratios of the content analysis of NFPP and UNSPF policy document reveals that NFPP has low coherence with UNSPF policy document to achieve increased sustainable forest goal.

5.1.4 Goal: 4 Mobilize Financial Resources

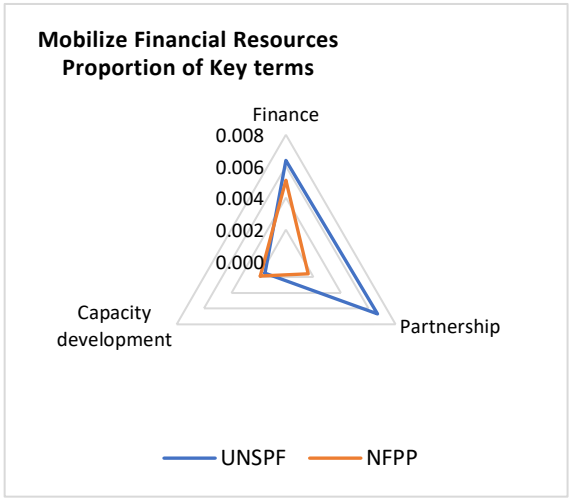
Financial support (incentives) is one of the instruments used to influence policy objectives and implementation of international policies (Giessen et al., 2016). This can be evident from the cooperation between the World bank and Argentina case study that how the financial and technical support influenced the country in devising forest policies for sustainable development (Sarah et al, 2016). We considered mobilize financial resources as thematic area to perform content analysis. We used the key terms "finance", "partnership" and "capacity development" in content analysis to figure out the coherence between NFPP and UNSPF policy documents. Table 7 demonstrates the results of content analysis of UNSPF and NFPP policy documents for thematic area of mobilize financial resources. We have frequencies of key terms, proportion of key terms in document, averages of key terms per page and risk ratios for each document.

Table 7 Showing content analysis results of UNSPF and NFPP documents for mobilize financial resources goal

Content Analysis Results on Mobilize Financial Resources Theme							
	UNSPF			NFPP			
Key terms	Frequencies	Proportion	Key terms/page	Frequencies	Proportion	Key terms/page	Risk Ratio
Finance	62	0.006	2.58	19	0.005	1.36	0.80
Partnership	65	0.007	2.71	6	0.002	0.43	0.24
Capacity development	15	0.002	0.63	7	0.002	0.50	1.22
Total	142	0.015	5.92	32	0.009	2.29	0.59

The key terms "finance", "partnership" and "capacity development" in UNSPF policy document have frequencies 62, 65 and 15 respectively. while "finance", "partnership" and "capacity development" in NFPP policy document have frequencies 19, 6 and 7 respectively.

The content analysis provided us the proportion of each key terms in policy documents. The key terms "finance", "partnership" and "capacity development" have proportion 0.006, 0.007 and 0.002 in UNSPF and 0.005, 0.002 and 0.002 for NFPP policy document respectively. The values of proportion of "capacity development" and "finance" in table 7 demonstrates that NFPP and UNSPF policy documents are coherent to achieve mobilize financial resources goal. "Partnership" exhibits very low coherence between NFPP and UNSPF policy documents. The sum of values of proportion of key terms 0.009 for NFPP and 0.015 for UNSPF describes that there is low



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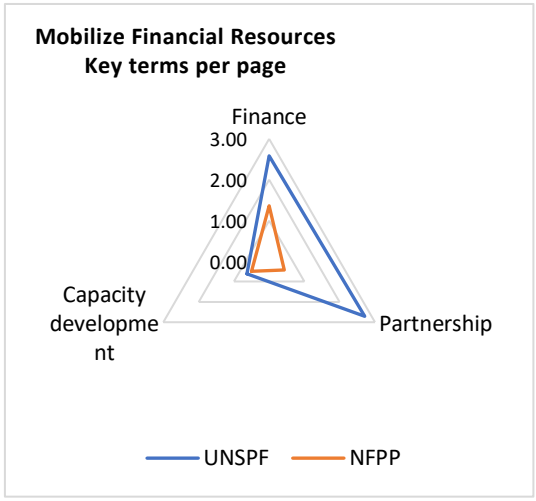

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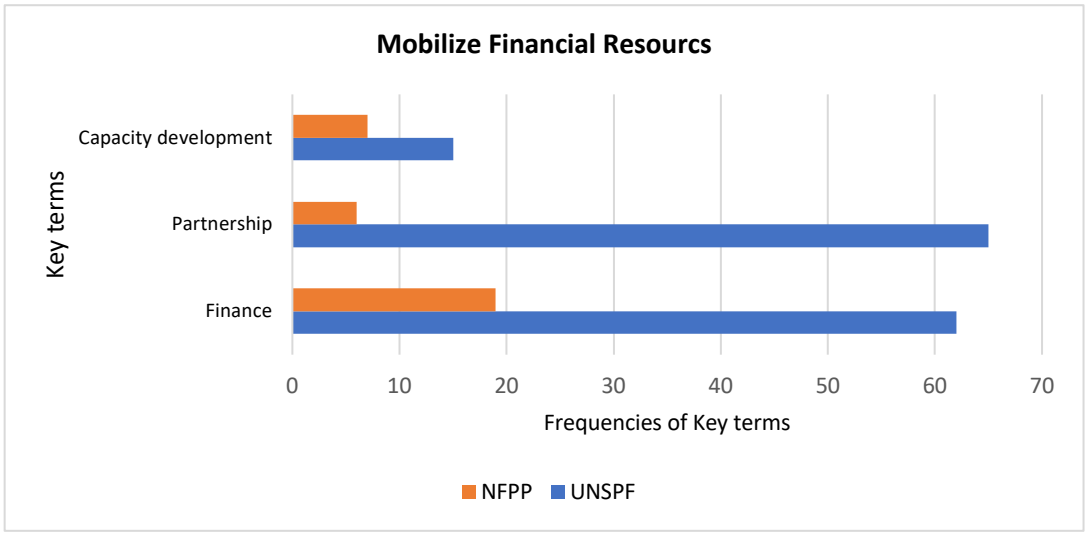


(c)

Figure 17 (a) Represents the comparison of proportion of key terms, (b) the average of key terms per page and (c) the frequencies of key terms used in UNSPF and NFPP policy document.

coherence between NFPP and UNSPF policy documents. The proportion being ratio of frequencies of key terms and total word count of the document have great significance in interpretation (Lowe, 2004b). The table 7 also provided average of key terms used per page which were 2.58, 2.71 and 0.63 for UNSPF while 1.36, 0.43 and 0.50 for NFPP policy document.

The average values of key terms used per page indicates that NFPP document have high coherence in “capacity development”, low for “finance”, very low coherence in “Partnerships”. The sum of values of key terms per page 2.29 for NFPP and 5.92 UNSPF policy document represents of low coherence of NFPP to the UNSPF policy document.

The chart in figure 17 (a) represents the comparison of proportion of key terms (b) averages of key terms per page and (c) frequencies of key terms in mobilize financial resources thematic area. The charts illustrate similar trend of low coherence between NFPP and UNSPF policy documents.

The risk ratios in table 7, display document pair comparison of NFPP to UNSPF policy document. The values 0.80, 0.24 and 1.22 for key terms “Finance”, “partnership” and “capacity development” respectively expresses the number of times key term observed in NFPP document when compared with UNSP policy document. The risk ratio of “capacity development” in NFPP are consistent with UNSPF policy document.

5.1.5 Goal: 5 Promote Governance

The table 8 displays the results of content analysis of UNSPF and NFPP policy documents to promote governance goal. The analysis results demonstrate the comparison of the frequencies of key terms used in each document, proportion of key terms, averages of key terms per page and risk ratio. The frequencies, proportion and average values of key terms used in each document are indication of their relevant importance for policy makers to attain this goal.

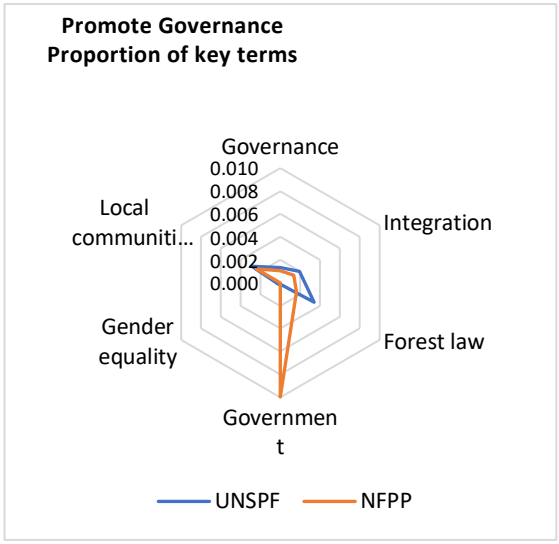
The key terms “governance”, “integration”, “forest law”, “government”, “gender equality”, “local communities” has frequencies 13, 16, 33, 1, 2, and 28 in UNSPF document while 4, 5, 6, 37, 0 and 9 in NFPP document respectively.

The average of key terms used per page indicates that there is very high coherence in “government”, high coherence in “local communities”, low for “governance”, “integration” and “forest law”. while non-coherence in “gender equality” between NFPP and UNSPF policy document. The sum of key terms per page is 4.36 for NFPP and 3.88 UNSPF policy document. It represents of very high coherence of NFPP to the UNSPF policy document. However, we noticed that one key term “government” having very high frequency in NFPP policy document skewed the data. If we exclude this key term from comparison the average of frequencies per drops down to 1.71. It has changed the level of coherence from very high to low coherence.

Table 8 Showing content analysis results of UNSPF and NFPP documents to promote governance goal

Content Analysis Results on Promote Governance Theme							
	UNSPF			NFPP			
Key terms	Frequencies	Proportion	Key terms/page	Frequencies	Proportion	Key terms/page	Risk Ratio
Governance	13	0.001	0.54	4	0.001	0.29	0.81
Integration	16	0.002	0.67	5	0.001	0.36	0.82
Forest law	33	0.003	1.38	6	0.002	0.43	0.48
Government	1	0.000	0.04	37	0.010	2.64	96.92
Gender equality	2	0.000	0.08	0	0.000	0.00	0.00
Local communities	28	0.003	1.17	9	0.002	0.64	0.84
Total	93	0.010	3.88	61	0.016	4.36	1.72

The proportion of key terms in policy documents indicates us the relative significance of each term in corresponding policy document. The key terms "Governance", "integration" and "forest law", "government", "gender equality" and "local communities" have proportion 0.001, 0.002,



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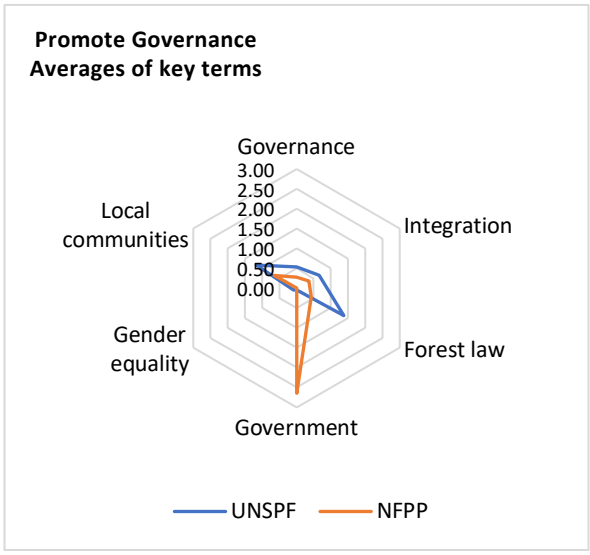

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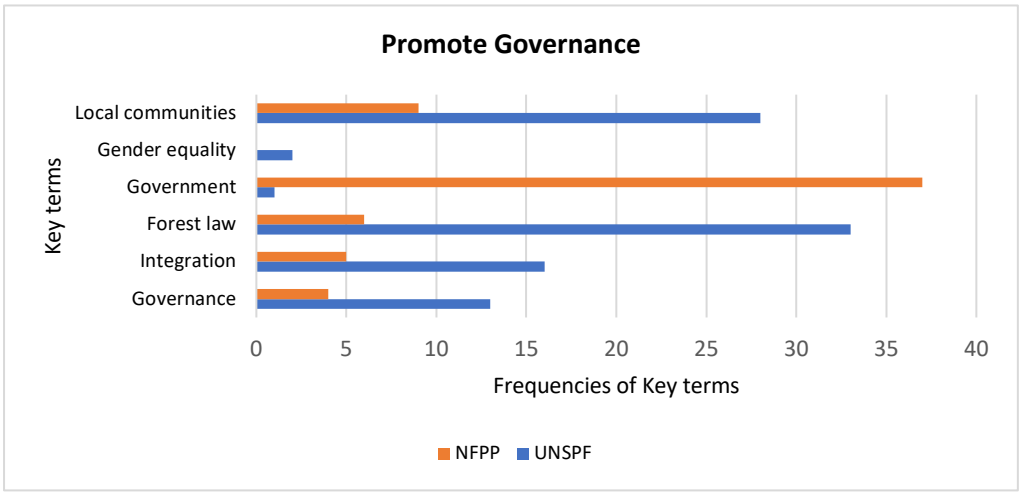


(c)

Figure 18 (a) Represents the comparison of proportion of key terms, (b) the average of key terms per page and (c) the frequencies of key terms used in UNSPF and NFPP policy document

0.003, 0.00, 0.00 and 0.003 in UNSPF and 0.001, 0.001, 0.002, 0.010, 0.00 and 0.002 for NFPP policy document respectively.

The proportion values of “governance” and “government” in table 8 demonstrates that NFPP and UNSPF policy documents are coherent to achieve promote governance goal. “integration”, “forest law” and “local communities” exhibits low coherence between NFPP and UNSPF policy documents.

The sum of proportion of key terms 0.010 and 0.016 describes that there is very high coherence between NFPP and UNSPF policy documents.

The term “government” in NFPP have very high proportion than UNSPF document which indicates the national policy makers focused in increasing administrative control for achieving promote governance goal. The RR in table 8 display document pair comparison of NFPP to UNSPF policy document. The RR values 0.81, 0.82, 0.48, 96.92, 0.00 and 0.84 for key terms “governance”, “integration”, “forest law”, “government, gender equality and “local communities” respectively. The RR values of “governance”, “integration” and “local communities” demonstrate less coherence between NFPP and UNSPF policy document.

The chart in figure 18 (a) represents the comparison of proportion of key terms, (b) represents the average of key terms per page and (c) denotes the frequencies of key terms used in UNSPF and NFPP policy documents to achieve promote governance goal. The policy makers while devising UNSPF goals emphasized on integration, forest law and enforcement and local community participation for achieving this goal. While analysis results for NFPP policy document are evident that the policy makers focused more on government and local communities to achieve promote governance goal.

The comparison of the values for proportion of key terms, averages of key terms and risk ratio in table

8 determine that key terms “governance”, “integration” and “local communities” have higher coherence. While comparison of values of key term “forest law” shows there is low coherence between NFPP and UNSPF policy documents. The comparative results of total sum of key terms used, proportion of key terms, averages of key terms per page and risk ratios of the content analysis of NFPP and UNSPF policy document discloses that NFPP has very high coherence with UNSPF policy document to achieve promote governance goal. However, it is pertinent to mention here that very high frequency of key term “government” skewed the data and its interpretation.

5.1.6 Goal: 6 Enhanced Linkages

Policy integration, namely, coordinated national plans, collaboration among governmental branches and organizational reforms will be interlinked in the process of reforestation policymaking (Sun & Yeo-chang, 2017). The table 9, embodies the results of content analysis of UNSPF and NFPP policy document for Enhanced linkages goal. The analysis results demonstrate comparison of the frequencies of key terms used in each document, proportion of key terms, averages of key terms per page and risk ratio. The frequencies, proportion and average of key terms used in each document are indication of their relevant importance for policy makers to achieve this goal. The sum of the frequencies of key terms 118 for UNSPF and 15 for NFPP policy documents convey that NFPP shows non coherence towards UNSPF policy document to achieve enhanced linkages goal.

The key terms "coherence", "cooperation", "coordination", "cross-sector", "synergies" and "collaboration" has frequencies 14, 29, 19, 7, 11 and 38 in UNSPF while 2, 1, 6, 2, 0 and 4 in NFPP Policy document respectively.

Table 9 Showing content analysis results of UNSPF and NFPP documents to enhanced linkages goal

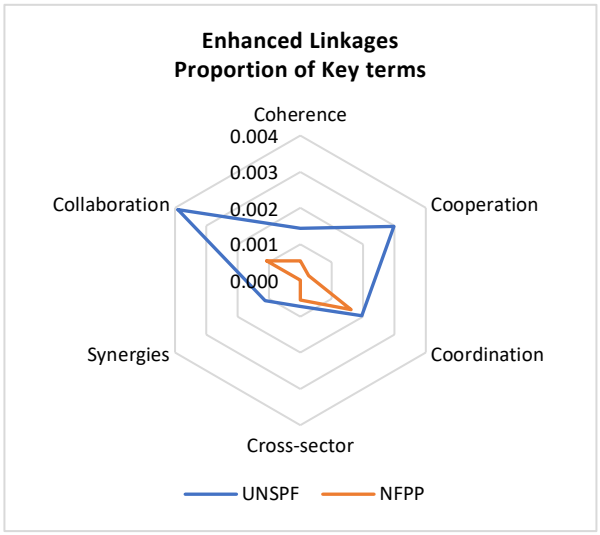
Content Analysis Results on Enhanced Linkages Theme							
	UNSPF			NFPP			
Key terms	Frequencies	Proportion	Key terms/page	Frequencies	Proportion	Key terms/page	Risk Ratio
Coherence	14	0.001	0.58	2	0.001	0.14	0.37
Cooperation	29	0.003	1.21	1	0.000	0.07	0.09
Coordination	19	0.002	0.79	6	0.002	0.43	0.83
Cross-sector	7	0.001	0.29	2	0.001	0.14	0.75
Synergies	11	0.001	0.46	0	0.000	0.00	0.00
Collaboration	38	0.004	1.58	4	0.001	0.29	0.28
Total	118	0.012	4.92	15	0.004	1.07	0.33

The table 9 provides the averages of frequencies "coherence", "cooperation", "coordination", "cross-sector", "synergies" and "collaboration" that are 0.58, 1.21, 0.79, 0.29, 0.46 and 1.58 in UNSPF while 0.14, 0.07, 0.43, 0.14, 0 and 0.29 in NFPP Policy document respectively. The averages values of key terms per page indicate that NFPP document have low coherence in "coordination" and "cross-sector", very low for "coherence" and non-coherent in "cooperation", "synergies" and "collaboration". The sum of key terms per page 1.07 for NFPP and 4.92 UNSPF policy document represents of very low coherence between NFPP and UNSPF policy document.

The table 9 also provide us the details of the proportion of each key term in UNSPF and NFPP policy documents. The key terms "coherence", "cooperation", "coordination", "cross-sector", "synergies" and "collaboration" have proportion 0.001, 0.003. 0.002, 0.001, 0.001 and 0.004 in UNSPF and 0.001, 0.00, 0.002, 0.001, 0.00 and 0.001 for NFPP policy document respectively. The

proportion of 0.001, 0.002 and 0.001 in key terms "coherence", "cross-sector" and "coordination" respectively represent the high level of coherence between NFPP and UNSPF policy document in achieving Enhanced linkages goal. The proportion of term "collaboration" demonstrates very low coherence between NFPP and UNSPF policy documents while non coherence for term "cooperation" and "synergies".

The term "cooperation" and "collaboration" in UNSPF document have higher proportion which indicates that policy makers more focused on "cooperation" and "collaboration" for achieving enhanced linkages goals. The risk ratios in table 8, exhibit document pair comparison of NFPP to UNSPF policy document. The values 0.37, 0.09, 0.83, 0.75, 0.00 and 0.28 for key terms "coherence", "cooperation", "coordination", "cross-sector", "synergies" and "collaboration"



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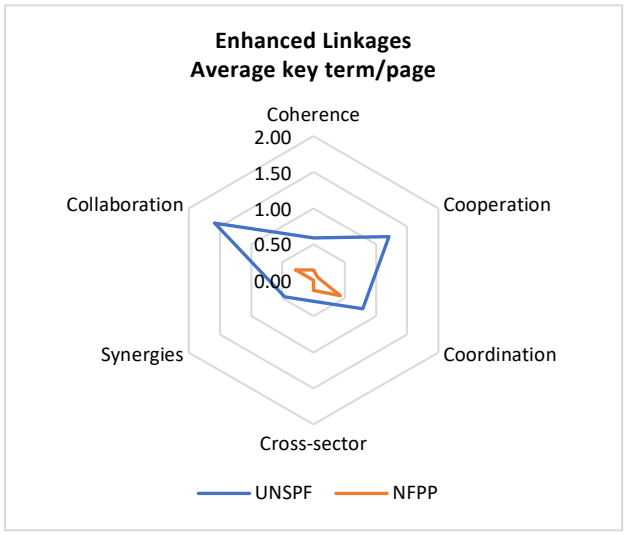

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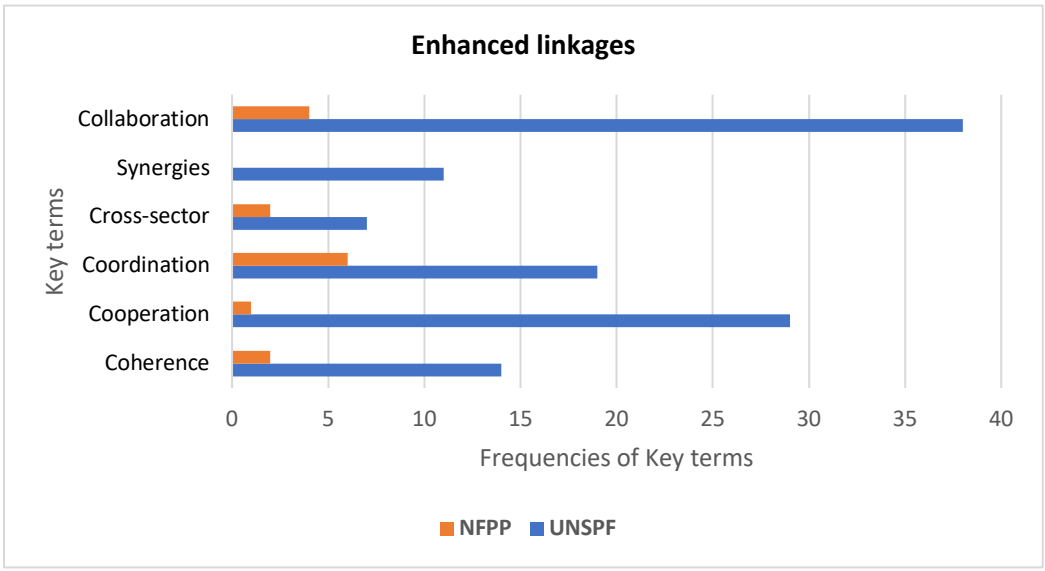


(c)

Figure 19 (a) Represents the comparison of proportion of key terms, (b) the average of key terms per page and (c) the frequencies of key terms used in UNSPF and NFPP policy document

respectively. The RR values of the key terms displays low to non-coherence between NFPP and UNSPF policy document.

The chart in figure 19 (a) represents the comparison of proportion of key terms, (b) represents the average of key terms per page and (c) denotes the frequencies of key terms used in UNSPF and NFPP policy documents to achieve enhanced linkages goal. The policy makers while devising UNSPF goals emphasized on cooperation, coordination, and collaboration for achieving this goal. while analysis results from NFPP policy document are evident that the policy makers focused more on coordination to achieve the goal.

5.2 Implementation of UNFF goals in Pakistan

5.2.1 Goal: 1 Reverse of forest loss cover

The first goal is to the reverse of forest cover loss by reducing the rate of deforestation and enhancing efforts to increase the forest area by afforestation, reforestation and protection of forests. In Pakistan, government forests are managed by provincial forest departments. These forests department are responsible for management of forests. As per provincial development statistics 2009-2017 data provided by the respective forest departments, the legal forest area is given in the table 10. The abrupt change in forest area took place from 2010-11 to 2011-12 with decrease in forest area from 7.315 million hectares to 4.436 million hectares which is 39.35% of total forest area in the country. This happened due to transfer of 2.55 million hectares designated forest area to CDA for improvement livelihood in desert area. From 2011-12 to 2015-16 there are changes in total forest area of the country. After 2015, the forest area remained intact. The data from 2009-10 to 2017-18 indicates that there is 39.52% decrease in forest area. The figure 20 represents the trend of forest area loss from 2009 to 2018. Pakistan has diversity of forest types from mangrove forests in south to Alpine and subalpine forests in north of the country. As per FAO criteria forests are divided into natural forests, other woodlands and Irrigated plantations. Natural forests and irrigated plantations are state owned forests. While other woodlands are, land not classified as forests and have tendency to reach threshold (FAO, 2015). The table 11 shows the forest cover

Table 10 Representing forest area in Pakistan

Year	Legal forest area
	million ha
2009-10	7.315
2010-11	7.061
2011-12	4.436
2012-13	4.7112
2013-14	4.761
2014-15	4.551
2015-16	4.424
2016-17	4.424
2017-18	4.424

Source: Development statistics of Punjab, Sindh, KPK and Balochistan 2010 to 2018

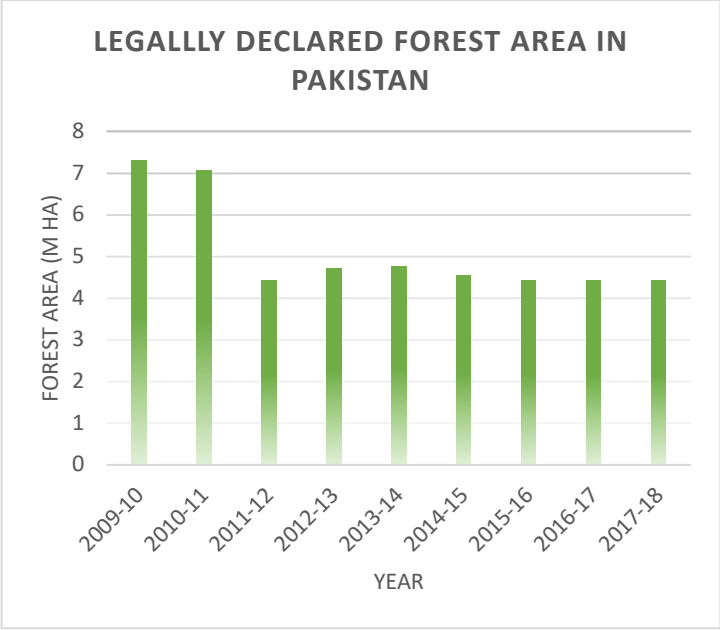


Figure 20 Representing legally declared forest area trend in Pakistan

data consulted from FAO Forest resource assessment report 2010, 2015 and afforestation data received from provincial forest departments.

It indicates that during the period 2000 to 2015 there is considerable loss of natural forest cover from 1.82 million hectare to 1.11 million hectares. It shows that country lost 39% of its natural forest cover in fifteen years. The FAO country report 2015 indicates that rate of deforestation during 2000 to 2010 in Pakistan was 43000 ha per year. In 2014-15 government of KPK started

Table 11 Represents the state of forest cover change in Pakistan in different reporting periods

Year	Natural forests	Other woodlands	Irr. Plantations
	(0000) ha	(0000) ha	(0000) ha
2000	1820	1323	296
2010	1347	1389	340
2015	1110	1521	362
2018	1317.8	1600.2	375.2

Source: FAO Forest resource assessment report 2015 & KPK forest department

BTTAP with a plan to restore 0.35 million hectares of forests and degraded land to surpass its Bonn challenge commitment.

The project completed in 2017 which increased the natural forest cover from 1.11 million hectares to 1.317 million hectares. The irrigated plantations owned by provincial forest department also depicted trend of increase in forest cover from 2000 to 2018. Sum of 35000

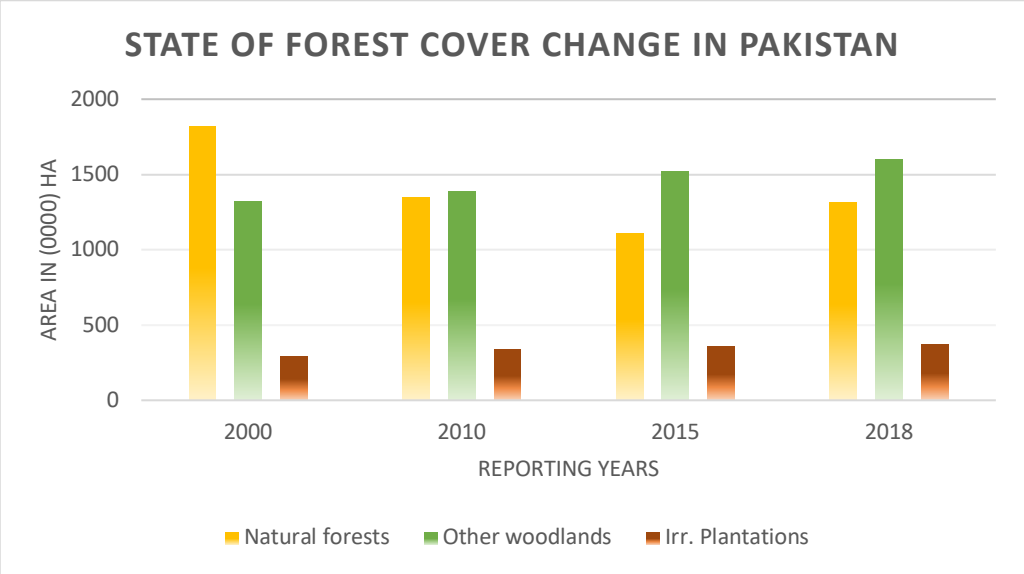


Figure 21 Represents the state of forest cover change in Pakistan in different reporting periods

hectares added to irrigated plantations through reforestation and restoration efforts in last 8 years.

Other woodlands category that is not classified as forests but likely to be in near future shows increasing trend in area from 2000 to 2018. The comparison shows that rate of increase in tree

cover for the reporting period 2000-10 was 6600 ha per year which increased to 26400 ha per year during reporting period 2010-18. The comparison of three reporting periods 2000, 2010 and 2018 gives us an overall perspective of forest cover change in the country with time. In the year 2000, the country's forest cover was 3.439 million hectares which decreased to 3.076 million hectares in 2010. The forest cover increased from 3.076 million hectares in 2010 to 3.293 million hectares in 2018 that was 7.06% increase in forest cover from 2010.

The figure 21 represents the state of forest cover change in three categories i.e. natural forests, irrigated plantations and other woodlands in different reporting periods. We can observe overall decrease in forest cover trend from 2000 to 2015 even though there is increase in forest cover in irrigated plantations and other woodlands category. In reporting period 2018 all three categories i.e. natural forests, irrigated plantations and other woodlands display substantive increase in forest cover.

5.2.2 Goal: 2 Enhanced forest- based benefits

The forests contribute towards economic, social and environmental values. The role of forests in providing ecosystem services i.e. provisional, supporting, regulatory and cultural invoke the policy makers to pay key attention for the management of forest resources (MEA, 2005). UNSPF considered the management of forests resources to get economic, social and environmental benefits on sustainable bases (UNFF, 2017).

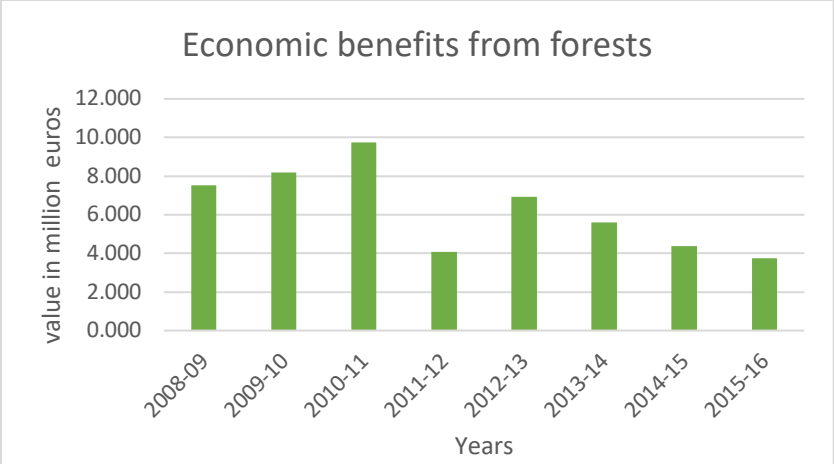
The economic benefits in this research considered the revenue generated from the sale of timber, fuelwood and Mazri. The provincial departments considered timber production and fuelwood as main source of revenue. The table 12 represents the economic benefits of forests collected from the development statistics data from 2009 to 2016. The out turn was high during the year 2009, 2010 and 2011 and gradually decreased in upcoming years. The economic benefits from state forest declined almost 50% from 2009 to 2016.

Table 12 Represents the economic benefits from forests in Pakistan

Year	Economic benefits	
	Pkr. in million	Euro in million
2008-09	926.936	7.509
2009-10	924.579	8.181
2010-11	1170.302	9.740
2011-12	487.698	4.061
2012-13	935.883	6.933
2013-14	750.869	5.597
2014-15	497.860	4.366
2015-16	434.224	3.747

The figure 22 shows the yearly economic out turn from forest resources of the country. The chart shows increasing trend in first three years and decline in revenue in subsequent period. The decline in revenue linked especially with policy actions. The government of KPK stopped extraction of timber from natural forests in 2013. The KPK province contributed 63% in 2009, 69.3% in 2010 and 64% in 2011. In the meanwhile, the Government Punjab forestry department exercised ban on stumpage of canal side plantations in 2015. The impact of these two policy measures quite visible in revenues 5.597 million euros, 4.366 million euros and 3.747 million euros for the year 2014, 2015 and 2016 respectively. These policy measures not only affected the revenues but also compromised livelihood of forest-based communities in remote areas. However, increase in development budget increased employment opportunities for rural people.

Figure 22 Representing the economic benefits from forests in Pakistan



Source: Provincial forests departments Punjab, KPK, Sindh and Balochistan

The table 13 represents the employment is forestry sector and biomass stock in the country. The employment data show the opportunities offered by the forest sector to improve the livelihood of forest-based communities and its contribution towards poverty reduction, rural development and social welfare. The data displays that Pakistan forestry sector during year 2000 provided

Table 13 Representing employment in forestry sector and total biomass stock in Pakistan

Year	Employment	Biomass
	(000) years FTE	million tons
2000	2.9	576
2010	3.2	453
2011	3.41	NA
2012	3.47	NA
2013	3.6	NA
2014	3.13	NA
2015	4.25	370
2016	5.8	NA

Source: FAO country report, 2015. Provincial forest departments Punjab, KPK, Balochistan and Sindh.

29000 FTE years for employment. In 2010, forestry sector employed 3200 FTE years. The is

increasing employment trend in forestry sector from 2000 to onward. This employment data in forestry sector includes employment for primary production of goods, activities directly related to services from forest and woodlands including administrative staff of forest sector in the country. During 2015 and 2016 there is considerable increase in employment opportunities in Pakistan forestry sector. This abrupt increase in employment was due to KPK government

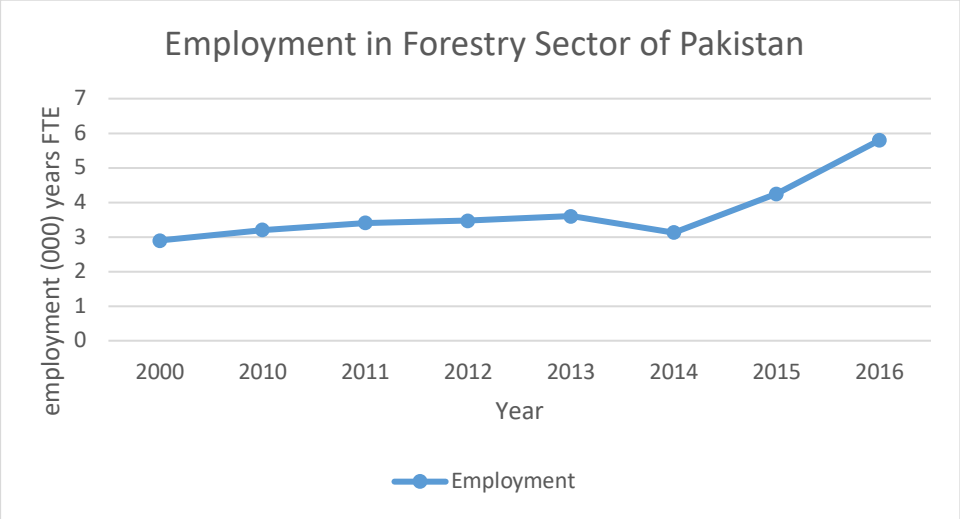


Figure 23 Representing the employment trend in forestry sector of Pakistan

initiative of reforestation of 0.35 million hectares from 2014 to 2018. The govt spending by KPK forest department during year 2015 and 2016 were 18.656 and 43.382 million euros respectively. The table 13 also displays the total biomass stock in forestry sector of Pakistan. Total biomass comprises of biomass of trees above and below ground level. The data from forest resource assessment report 2015 indicates continuous decrease in biomass stock from 2000 to 2015.

The available biomass stock in 2000 was 576 million tons which reduced to 453 million tons in 2010. The biomass further declined to ever low 370 million tons in 2015. This also justify the decreasing forest cover trend in Pakistan from 2000 to 2015. The total carbon sink in 2010 was 217 million tons which decreased to 178 million tons in 2015 (FAO, 2015). It is estimated that under BTTAP, newly planted trees will sequester 0.04 Gt CO2 which will be great contribution towards enhancing environmental benefits from forest resources (Kamal et al., 2019).

The figure 23 represents the employment trend in forestry sector in Pakistan. The curve shows nominal increase in employment in forestry sector from 2000 to 2014 with steep rise from 2014 to 2016. The main reason for steep rise in employment in forestry sector was KPK government initiative of planting trees under BTTAP project in 2014 and Green Pakistan Program by the federal government in 2016.

5.2.3 Goal: 3 Increased sustainable forest management

Sustainable forest management is evolving and dynamic concept of management of natural resources with balanced approach. UNSPF policy document focussed on this sustainable management of forests and had given prime importance (UNFF, 2017). In Pakistan, state forests are owned and administered by provinces (GoP, 2015). As per questionnaires feedback and Forests resource assessment 2015, the national forest policy addressed the sustainable forest management at public and private owned forests. However, there are no forest policies to address sustainable forest management at provincial and local level. The country did no adopt and implement legislation and regulations supporting SFM at any level. Criteria and indicators developed for providing guidelines to access sustainable forest management still not implemented in Pakistan. There is no data available on the status of sustainably managed forests. The table 14 represents the progress on implementation of increased Sustainable forest management in Pakistan.

Table 14 Representing national progress on implementation of SFM in Pakistan

Results of questionnaire representing progress on implementing SFM in Pakistan			
Description	National	Provincial	Local
1. Policies supporting SFM	yes	no	no
i. Public owned forests	yes	no	no
ii. Private owned forests	yes	no	no
2. Legislation and regulations supporting SFM	no	no*	no
i. Public owned forests	no	no*	no
ii. Private owned forests	no	no*	no
3. Criteria and indicators used	no	no	no
4. Periodic reports on SFM	no	no	no

*KPK government introduced KPK forest ordinance 2002 as an instrument to implement sustainable forest management.

Source: questionnaire response from CCF offices in Punjab, Balochistan, Sindh and KPK

The enforcement of law related to forest and wildlife protection and offences through various legal instruments like the Pakistan Forest Act 1927, Hazara Forest Act 1936, provincial wildlife acts/ordinances and related acts has been ineffective and very weak. Forest departments have been unable to cope with the growing forest encroachments, theft and illegal logging cases in civil courts.

5.2.4 Goal: 4 Mobilize financial resources

Mobilization of financial resources (incentives) is one of the important instruments used for effective implementation of policy initiatives. The increase in development expenditures in forestry sector is instrumental in increasing of forest cover. The table 15 represents the yearly allocation of financial resources in forestry sector of Pakistan. Forestry sector in Pakistan receives low development resources compared to other sectors i.e. agriculture and livestock (ESP, 2015). It is evident from the table 15 that there is no significant increase in development expenditures from the year 2009-10 to 2013-14 in forest sector of Pakistan. There is decrease in development allocations from 9.22 million euros in 2012-13 to 7.71 million euros in 2013-14. The increasing trend of allocation of development funds in forestry sector is observed from fiscal year 2013-14 to onward. The frequent increase in budget allocation was due to launching of billion tree tsunami afforestation project (BTTAP) in 2014 by KPK forest department under Green Growth initiative (Kamal et al., 2019). According to ESP (2016), during fiscal year 2016 government of Pakistan allocated 3.652 billion rupees (31.56 million euros) under another

Table 15 Representing allocation of financial resources in forest sector of

Year	Dev. expenditures million Pkr	Dev. expenditures million euros
2009-10	1252.33	11.08
2010-11	1444.38	12.02
2011-12	1196.68	9.97
2012-13	1244.39	9.22
2013-14	1034.37	7.71
2014-15	2350.37	20.61
2015-16	5360.80	46.26
2016-17	4938.25	41.48

Source: CCF offices & development statistics of Punjab, Balochistan, KPK and Sindh Province 2009-2017.

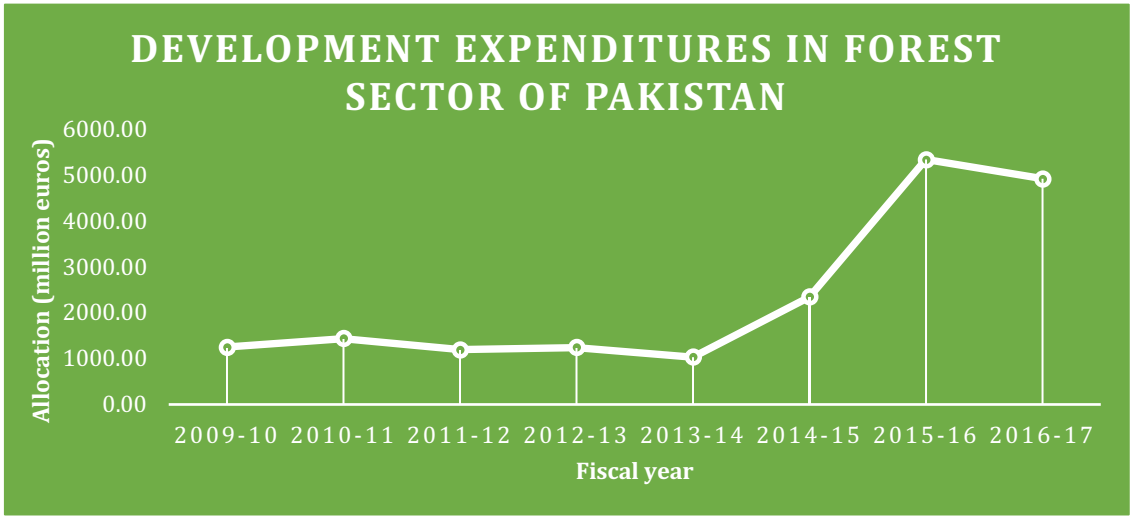


Figure 24 Representing the trend of allocation of development budget in forestry sector of Pakistan

initiative titled “Prime minister Green Pakistan Program- Revival of Forest Resources in Pakistan” for the period of five years (2016-2021). The government of Pakistan have approved another project titled “Ten Billion Tree Tsunami Program” for the period of eight years (2016-2024) and allocated 98.051 billion rupees (573.1295 million euros) for revival of forestry in the light of international conventions and national and provincial legislative framework (ESP, 2018). If we compare the development budget during fiscal year 2013-14 and 2016-17, there is 538% increase in development expenditure of forestry sector. The figure 24 represents the trend of allocation of financial resources in forestry sector of Pakistan from 2009 to 2017. The curve is flat from 2009 to 2014 and then shows steepness which indicates increase in budget allocation from 2014 onward. Pakistan is a member of UNFCCC and implementing REDD+ readiness preparing proposal. R-PP is being implemented in Pakistan with a grant of $ 3 .8 million (3.38 million euros) since July 2015. Pakistan was awarded the grant through a competitive process by FCPF of World Bank. Meanwhile in 2018, an additional grant of $ 4.01 million (3.43 million euros) has also been awarded by FCPF to further support the preparedness activities in Pakistan till June 2020 (ESP, 2018).

The trainings are being arranged for the officers to equip them with new skills in forest sector and their capacity building in different forestry institutions i.e. Pakistan forest institute, Peshawar, Forest service’s academy Gora gali, and Punjab forest research institute, Faisalabad.

5.2.5 Goal: 5 Promote governance

The forest governance to enhance sustainable management of forest resources is among the objectives to achieve UNFF goals. The table 16 represents the results of the questionnaire distributed among provincial forest departments to assess progress of respective forest departments to achieve sustainable goals. The government of Pakistan have taken steps for the integration of forests into national sustainable development plans. Green Pakistan program 2016, Ten billion Tree Tsunami program 2019 are among the examples. This indicates that government of Pakistan is committed towards management of forest resources.

In respect of government steps to prevent illegal trafficking of forest products, there is no new legislation introduced. The provincial forest departments increased the fines and penalties against forest offenders. There are check posts established to control the movement of forest produce inside the country, but they are less effective. There are no new measures adopted to improve import and export of forest products. The forest products imports and exports follow WTO rules. Institutions like ITTO and UN-FLEGT are playing key role in sustainable forest management and trade of certified forest products. Pakistan didn’t join ITTO or UN-FLEGT yet.

Table 16 Representing the results of questionnaire about promoting governance to achieve global forest goals.

Results of questionnaire of Promote Governance to achieve global forest golas		
Description	Response	Remarks
1. Integration of forests into National sustainable development plans	partial	SFM criteria and indicators are not implemented yet
2. Government steps to prevent illegal trafficking of forest products		
i. New legislation	no	
ii Improved enforcement of existing legislation	yes	Increased fines and penalties against forest offenders
iii. Export and import controls	yes	WTO
iv. Bilateral agreement b/w exporting and importing countries	no	Not a member of ITTO, UN-FLEGT
3. Public- private partnership	Partial	i. South Punjab forest company, ii. forest village councils
4. Mechanism for cross-sectoral policies	partial	At National level, It doesn's exists at provincial level
5. Does the cross-sector mechanism exist for land use planning and development	no	
6. Signatory of international institutions, conventions and processes	yes	UNFF, UNFCCC, UNCCD,IUCN, CITES, UNCBD, Ramsar convention

Source: Questionnaire response from CCF offices in Punjab, Balochistan, Sindh and KPK.

In 2015, The government of Punjab forest department established south Punjab forest company to manage state forests through public-private partnership, but government of Punjab exercised temporary ban on working of this company. During Billion tree tsunami afforestation project (2014-18) village forest councils were also established to make decision at local level. Mechanism for cross sectoral policies exists at national level for horizontal policy integration. While at provincial level it doesn't exist. There is no specific platform to integrate cross sectoral forest policies. land use change is one of the major reasons of deforestation in the country.

There is no effective mechanism exist to combat deforestation by controlling land use change for agriculture and urban development. Pakistan is a signatory and member of important international institutions, convention and agreements focusing on sustainable forest management, climate change, combating desertification, trade in endangered species, enhancing biodiversity and conservation of wetlands.

5.2.6 Goal: 6 Enhanced linkages

Enhanced cooperation, coordination and coherence are important for implementation of forest policies. The table 17 represents FRA, 2015 report and response of CCF offices from Punjab, Balochistan, Sindh and KPK provinces towards action have been taken to achieve the objective of increasing cooperation, coordination and collaboration among stakeholders on forest related issues. The result indicates that there is no specific cross sectoral mechanism exists for cooperation and coordination to manage the forests sustainably.

Criteria and indicators for sustainable development have not used to generate national reports, monitoring and assessment and review the national policy. The concept of sustainable management needs to communicate further to private sector and forest dependent communities. The government just involved Inspector general of forests, Provincial forest departments, ministry of climate change, ministry of planning and finance department in planning, development and implementation of decisions on forest resource management in the country.

In Policy formulation process, NGOs (i.e. WWF, IUCN), forest associations farmer's association were involved. During planning and operational phase, only forest departments entitled to take decision on certain issues. The certification is used as tool to ensure sustainable management of forest resources. There is not a single state owned or private, FSC and PEFC certified forests in the country. Domestically forest departments issue permits and receipts for transportation of timber.

There is no uniform certification system which creates problems during interprovincial transportation of timber. The concept of gender equality is partially implemented as women's have no or little access to control and use of forest resources. The KPK forest department during BTTAP project ensured women's participation in nursery raising and involved the village women in meeting arranged to enhance their skills.

Table 17 Represents the results of questionnaire to assess the Enhanced linkages at National level to achieve UNFF goals

Results of Questionnaire to assess the Enhanced linkages at National level to achieve UNFF goals		
Description	Response	Remarks
1. cross sectoral cooperation and coordination for SFM	no	No specific mechanism, concept of SFM not implemented yet
2. C & I for sustainable forest management used in provinces	no	In a phase of describing the C & I of SFM
i. To generate national reports	no	
ii. For monitoring and assessment	no	
iii. To review national forest policy	no	
iv. To communicate with society	no	
v. To report on forests to international organisation	no	
3. Communication and awareness of SFM concept	Partial	
i. Government sector	yes	The concept already there. But not implemented yet
ii. Private sector	no	
iii. Forest communities	no	
iv. Civil society	yes	
4. Actions to involve major groups and relevant stakeholders involved.	partial	IGF, PFDs, MoCC, MoP,FD
5. stakeholder's involvement at		
i. Planning phase	no	
ii. Operation phase	no	
iii. Review Operation phase	no	
6. Enforcement of forest certification		
i. FSC	no	
ii. PEFC	no	
iii. Domestic certification	partial	i. Department certify the forest products, but not cover the whole country
7. Promote Gender equality	partial	
i. Women's effective access to control and use of forest resources	partial	women are engaged in raising plant nurseries.
ii. Women's effective participation in decision making at community level	partial	i. KPK FD ensured their participation in nursery raising and meetings
iii. Women's effective participation and representation in forest mgt institutions	partial	i. At officer level: yes, ii. At official level: no
8. Actions to observe the International Day of Forests		
i. Cultural activities	yes	
ii. Educational activities	yes	
iii. Media activities	yes	
iv. Social media activities	yes	

Source: FRA, 2015 & questionnaire response from CCF offices in Punjab, Balochistan, Sindh and KPK

While rest three provinces have not involved women to participate in decision making process. The women's participation and representation in institutions are nominal. In forest departments, at officers' level there is less than 5% women officers. Women representation at lower staff level is less than 1%. International day of forests observed nation-wide through cultural, educational, media and social media campaigns.

6 Discussion

We analyzed coherence at the level of objectives, instruments or in implementation processes (Nilsson et al., 2012; Volkery et al., 2011) and use the term coherence to show the extent to which the NFPP policy already address or can incorporate the UNFF goals to 'produce' a meaningful and integrated policy at each of the levels. We investigated internal (or vertical) coherence to understand the link between goals, objectives, instruments, and the implementation processes within a particular policy field as well as the coherence between the UNFF goals and the NFPP policy.

6.1 Coherence attributes of national forest policy to achieve UNFF goals

The results of content and comparative analysis to assess policy coherence at adoption and implementation level found that policy coherence was observed in several thematic areas of UNFF goals. In thematic area of recover the forest cover loss, policy coherence is observed in protecting, conservation and afforestation objectives. The national forest policy in setting objectives and at implementation phase is coherent to UNFF goal of recovering forest cover loss. The study has observed that national forest policy to address UNSPF objectives are more explicit in addressing drivers of reforestation/afforestation, protection and conservation to recover the forest cover loss in the country. Reforestation/ afforestation and restoration efforts from 2015 onward at implementation level supported national policy statements towards addressing reverse of forest cover loss goal.

About 0.35 million ha reforested and restored in state forests under BTTAP project. The same results have been observed (Kamal et al., 2019) where they mentioned that under BTTAP one billion trees have been successfully planted in KPK province of Pakistan during 2015-17. This provided a great contribution towards restoration of forests as 2% of the deforested land area recovered in KPK province. The protected and conserved areas remained intact during reporting period.

In enhanced forest-based benefits from economic, social and environmental benefits goal, the social benefits displayed coherence at adoption and implementation level. As a consequence of projects in forestry sector a substantive increase in employment of forest dependent communities have been seen. The employment in forestry sector increased from 29000 FTE years to 58000 FTE years. This contributes towards improvement of livelihood of forest dependent people. The role of forest has been widely acknowledged in enhancing livelihoods at the microlevel and mitigating climate change at the macro level (Locatelli et al., 2010; Nkem et al., 2010; Pandey et al., 2016).

For the enhanced financial resources goal, the coherence is observed in efforts to enhance financial allocations by all means and capacity development of forestry professionals. About 538% increase in development budget for management of forest resources. The government received financial support worth 3.38 million euros from international institutions i.e. FCPF of World bank (ESP, 2018). Increased budget allocations for management of forest resources in the country, indicates government commitment to increase forest cover through reforestation, restoration and afforestation projects. In addition to existing training institutions, the establishment of forest services academy in year 2016 was a milestone. This institution specifically offered trainings for forestry officials which would be helpful in enhancing skills and equip them with modern approaches for sustainable management of forest resources.

The policy coherence is found between national forest policy and UNFF goals in integration of forests into national sustainable development plans. However, the provincial governments did not integrate forests into sustainable development plans yet. To control illegal logging, the provincial governments adopted coercive approach and increased fines and penalties of forest offences. To regulate imports and exports of forestry products, the government is relying on WTO instrument. At national level under the ministry of climate change the country developed a mechanism for creating synergies in cross-sectoral policies but its non-existent at provincial level. The ratification of several international conventions, forums and agreements especially UNFF justifies country's commitment to improve governance towards sustainable management of forest resources.

There is least coherence in national forest policy and UNFF goals in enhancing cooperation, coordination, collaboration and creating synergies at al level to promote sustainable management of natural resources. At national level, progress is underway to adopt Criteria and indicators for sustainable forest management and devise uniform mechanism for monitoring and evaluation of forest resources. KPK forest department adopted inclusive approach for women participation in decision making, control and use of forest resources. The country engaged in observance of international days of forests through cultural, educational and media campaigns to create awareness among people.

6.2 Non coherence attributes of National forest policy to achieve UNFF goals

National forest policy is noncoherent in controlling the deforestation objective at implementation stage. The FAO 2015 reported deforestation rate is 43000 ha per year which was the highest in the region. At adoption phase coherence is perceived for controlling deforestation but the inconsistencies have been observed in addressing deforestation at implementation level. The country has high deforestation rate which means the government of Pakistan efforts to recover

the forest cover loss will be less effective for sustainable management of forest resources. The results are consistent as (Nazir et al., 2018) described that deforestation rate is high in Pakistan. In the absence of land control policy, forest land conversion is going unchecked.

Forest dependent communities are liable for deforestation by exploiting forests for fuelwood, using timber for building homes, changing land use for cultivation and grazing. (Ali et al., 2006) found that penurious forest management, bad governance and having sagging control on timber mafia are among the drivers of deforestation. In India, prime drivers of deforestation can be listed as agricultural expansion along with increasing demand for wood, expansion of settlements, shifting cultivation and infrastructure development (MoEF, 2009). The country has to improve institutional set up and adopt participatory approach to reduce deforestation.

Non coherence was discerned in NFPP policy at implementation stage in realizing economic and environmental benefits. There is continuous decline in revenue from forest products. The revenues of 8.181 million euros during year 2010 declined to 3.747 million euros in 2016. Exercising ban on extraction of forest produce in KPK and Punjab provinces was the main reason for decrease in revenues from forest resources.

Forest products diversification was not observed. Ecosystem services concept was not integrated into provincial policies. It indicates that provincial forest departments are not managing forest resources sustainably. The decreasing trend of available biomass from 453 million tons to 370 million tons indicates depletion and degradation of forest resources. The present government policy of restoration and reforestation of forest resources in the country will be helpful to increase economic and environmental benefits. The analysis of impact of BTTAP found that economically 120 million US dollars will be generated as a revenue while the new planted trees will sequester 0.04 Gt CO2 as a climate benefit in future (Kamal et al., 2019).

Forest administration badly failed to adapt criteria and indicators of sustainable forest management and its implementation at provincial level. Sustainability indicators are science-based measures that provide a consistent approach to assess, monitor and report progress on SFM to a wide range of stakeholders and institutions, including governments, the private sector, non-governmental organizations, donor organizations, researchers and the public (FAO, 2015).

Sustainable forest management is not practiced in its complete form and true sense in Pakistan as its parameters are not yet understood by the forest managers (FAO, 2009). Sustainable management objective included in national forest policy but not implemented. Two of the four provinces did not have legislation to support sustainable forest management.

Inadequate legal frameworks hinder policy implementation (Colchester et al., 2006). Sustainable management of forest resources is widely accepted concept. The international policy regime strongly supported adoption and implementation of SFM policies. In a study (Syampungani et al., 2009) find that for management of forests sustainably, there is a need for an enabling legal

framework to devolve management responsibility and authority to local communities to improve management and monitoring. Policies are guidelines, legislative provisions are the real instruments to implement a policy, thus policies require supporting legislation (Helvetas, 2011). Thus, it is quite pertinent to adopt criteria and indicators and necessary legislations for successful achievement of sustainable forest management goal.

The national forest policy stressed more on government top down approach compared to governance for sustainable management of forest resources. There is no stakeholder's participation in decision making consequently least acceptability of reforms among forest dependent communities. Many studies have identified a multi-stakeholder engagement approach at different levels of governance as a means of increasing coherence and overcoming barriers to implementation (Atela et al., 2016).

Lack of staff as per actual strength further weakens the enforcement capability. A failure to allocate appropriate human resources, both qualitative and quantitative, can also lead to a failure of policies as implementation becomes unfeasible; lack of adequate staff for management and enforcement of policy implementation can be a major impediment (Dongol and Heinen, 2012).

To ensure transparency, there is no third-party evaluation mechanism exist at provincial level. poor governance and incapability of institution in enforcement of forest laws and legislation will result in increased deforestation rate.

Successful implementation of any policy depends on the organizational structure and work culture of an organization (Ranabhat et al., 2018). The current forest institutional set up in Pakistan is century old. This is another reason for failure of departments in controlling deforestation. The organizational reconstruction will also be supportive in successful implementation of policies. In South Korea, KFS which was under ministry of agriculture and forestry shifted to ministry of home affairs. This reorganization, administrative power of KFS along with local and police administration power of MHA proved result oriented in implementation of reforestation programs (Sun & Yeo-chang, 2017).

National forest policy of Pakistan shows non coherence in achieving UNFF goal of enhanced cooperation, coordination, collaboration and creating synergies. It is found that this is the most neglected in national forest policy. At national level, ministry of climate change is cooperating, coordinating with provincial and international institutions. However, the provincial forest departments who are responsible for sustainable management of forest resource are not implementing it.

An unstable political situation lack of communication among implementing agencies can all create challenges to implementation and hinder intersectoral synergy (Dixit et al., 2016). Polices may be coherent in their stated objectives, and even in the instruments proposed to achieve the objectives, but lack of synergy at implementation level can prove to be a major hindrance (Nilsson

et al., 2012). Several ministries i.e. MCI, MHA, MAF collaborated to control timber harvesting and firewood collection from the forests. MCI provided and increased the supply of coal to households to reduce firewood use which was major driver of deforestation and forest degradation. MAF through its NFDPs reforested the areas through land management strategies. While MHA in cooperation with MAF prohibited the inflow of fuelwood in major cities and developed firewood plantations in remote areas to release the fuelwood extraction pressure on forests (Sun & Yeo-chang, 2017).

6.3 Limitations of the study

The study has few limitations which are as under

- The provincial forest departments have not incorporated internationally adopted FAO "Forest" definition "Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use" (FAO FRA, 2015). They considered the legal definition of forest adopted in respective provinces. For instance, forest definition provided in Punjab Forest Act 1927 amended 2010 under section 2 clause (c) "forest' means "a reserved forest, protected forest, unclassed forest and village forest and includes wasteland or rangeland".
- UN recommended parameters for monitoring, assessment and reporting on progress towards implementation of UNSPF 2017-30 (UNFF, 2018). Data for some of the parameters were not available. For instance, the provinces did not collect data on total biomass and carbon sink. In this case, we used linear interpolation method for prediction of values for parameters.
- United Nations strategic plan for forests 2017-30 adopted recently in 2017. Its reporting period started from 2015. The first report on the progress will be submitted in 2020. Since not enough time would have elapsed since the adoption of the strategic plan. So, the results represent the government initiatives towards sustainable management of forest resources. The future studies will cover the further progress on implementation of UNSPF goals.

7 Conclusion & Recommendations

This study shows that UNFF goals has so for not been coherently adopted and implemented in national forest policy Pakistan. The national forest policy of Pakistan addressed reforestation, restoration and control of deforestation to recover the forest loss cover objective devised under UNFF goals. The country successfully reforested and restored 0.385 million ha. However, when analyzed at implementation stage the correlation of both the analysis showed that coherence is observed at all level for reforestation and restoration but non coherent for deforestation at implementation level. Introduction of new legislation, redefining rights of forest dependent communities, public participation in decision making in management of forests, modification/restructuring in century old centrally controlled top-down bureaucratic arrangement for forest management, improvement in present judicial set up and facilitation of forest-based communities are required to curb the menace of deforestation.

The coherence between the NFPP and UNFF goals in economic and environmental benefits for enhanced based benefits observed at adoption level and low coherence for social benefits. At implementation level there is non coherence for economic and environmental benefits. The yearly revenue from forest products reduced to 3.747 million euros in 2015-16 which was lowest in last five years. during reporting period 2010-2015 the biomass and carbon sink reduced by 18.32% and 17.97% respectively.

To enhance coherence for economic and environmental benefits, the country needs to diversify its sources of income from forest resources, ecosystem services concept should be implemented, REDD++ initiative which is in its early phase shall be implemented proactively. Assessment of available forest resources as per international standards is required to use the resources sustainably.

Low coherence in achieving Increased sustainable forest management at national level required to adopt and implement C & I for sustainable forest management at all levels in the country. Sustainable concept shall be introduced in provincial forest laws which will be instrumental in implementation of forest policies. The mobilization of financial resources goal showed coherence. From 2013-14 to 2016-17 development budget has increased 538% for development and management of forest resources in the country.

The safeguards should be introduced to maintain transparency in use of resources. The continuity of flow of financial support from national and international financial institutions should be maintained to ensure increase forest cover in the country. The budget shall be allocated for restructuring century old departmental set up.

Low coherence between NFPP and UNFF goal has been recorded to achieve promote governance goal. There is no substantial change in governance structure in the country since colonial era early

19th century. The powers are concentrated at the top, no devolution of powers to lower authorities. The communities have very little or no role and participation in planning and management of forest resources. Illegal logging is one of the grave issues, the provincial forests departments are to deal with. The provinces have their own rules and check posts to control the transportation of forest produce but lack of uniform certification system and low enforcement capacity results in bad governance. It is recommended that forest certification schemes will be introduced, and UN FLEGT suggestions require to be followed for sustainable management of forest resources.

During analysis non coherence was observed between NFPP and UUNFF goals at adoption and implementation level to enhance policy coordination and cooperation. The national forest policies set guidelines for provinces to formulate and implement their own forest policies. However, none of the provinces adopted or implemented new forest policy in last two decades. This results in lapses of proper guidelines for cooperation, coordination, collaboration and synergies at all levels in forestry departments. The study found that government of Pakistan emphasizing more on reverse of forest cover loss and mobilizing financial resources goals to achieve sustainable management of resources. While paid less attention towards achieving enhanced Forest-based benefits, improve governance, cooperation and coordination for implementation of UNFF goals.

8 Bibliography

Ahmed et al., 1998. Changing perspectives on forest policy. Policy that works for forests and people series no. 1. IUCN Pakistan and International Institute for Environment and Development, Islamabad and London.

AFTAB, E., & HICKEY, G. (2010). Forest administration challenges in Pakistan: The Case of the Patriata Reserved Forest and the 'New Murree' Development. The International Forestry Review, 12(1), 97-105. Retrieved from http://www.jstor.org/stable/24309857.

Akhtar-Schuster M, Thomas RJ, Stringer LC, Chasek P, Seely M (2011) Improving the enabling environment to combat land degradation: institutional, financial, legal and science-policy challenges and solutions. L Degrad Dev 22:299–312. https:// doi.org/10.1002/ldr.1058.

Ali et al., (2006). Analysis of Myths and Realities of Deforestation in Northwest Pakistan: Implications for Forestry Extension. INTERNATIONAL JOURNAL OF AGRICULTURE & BIOLOGY. Retrieved from http://www.fspublishers.org

Almer, C., & Winkler, R. (2017). Analysing the effectiveness of international environmental policies: The case of the Kyoto Protocol. Journal of Environmental Economics and Management, 82(December 1997), 125–151. https://doi.org/10.1016/j.jeem.2016.11.003

Andersson et al., 2005. Municipal Politics and Forest Governance: Comparative Analysis of Decentralization in Bolivia and Guatemala. World Development Vol. 34, No. 3, pp. 576–595, 2006. doi: 10.1016/j.worlddev.2005.08.009.

Assessment, M. E. (2005). Ecosystems and human well-being (Vol. 5). Washington, DC: Island press.

Atela et al., (2016) Implementing REDD+ at the national level: stakeholder engagement and policy coherences between REDD+ rules and Kenya's sectoral policies. Policy Econ 65:37–46. https://doi.org/ 10.1016/j.forpol.2016.01.003

Billion Trees Tsunami Afforestation Project (BTTAP), forestry, environment and wildlife department khyber pakhtunkhwa. http://103.240.220.71/btt/about-bttap/.

Brukas et al., 2004. A power analysis of international assistance to Lithuanian Forestry. Scand. J. For. Res. 2004, 19, 166–176.

Bukhari et al., (2012). Land Cover Atlas of Pakistan: Pakistan Forest Institute Peshawar.

Cadman et al., (2017). Five years of REDD+ governance: The use of market mechanisms as a response to anthropogenic climate change. Forest Policy and Economics, 79, 8–16. https://doi.org/10.1016/j.forpol.2016.03.008.

COFORD, 2018. COFORD Forest Policy Review Group Report on 'Forests, products and people - Ireland's forest policy – a renewed vision (2014). A Report on Policy Implementation with Recommendations. Department of Agriculture, Food and the Marine, Dublin.

Colchester et al., (2006). Justice in the forest: Rural livelihoods and forest law enforcement. Centre for International Forestry Research (CIFOR): Bogor, Indonesia.

Corbera et al., (2011). Governing and implementing REDD+. Environmental science & policy, 14(2), 89-99.

Cowie et al., (2007). Potential synergies between existing multilateral environmental agreements in the implementation of land use, land-use change and forestry activities. environmental science & policy, 10(4), 335-352.

Cubbage et al., (1993). Forest resource policy. John Wiley and Sons, Inc.

Den Hertog, L., & Stross, S. (2011, April). Policy coherence in the EU system: concepts and legal rooting of an ambiguous term. In Conference paper The EU as a global player.

Development statistics of Sindh, bureau of statistics planning and development department government of Sindh. http://sindhbos.gov.pk/development-statistics/

Development statistics of Balochistan, bureau of statistics, government of Balochistan. https://balochistan.gov.pk/index.php?option=com_docman&task=cat_view&gid=1274&Itemid=677.

Development statistics of KPK, Bureau of statistics planning and development department government of KPK. http://www.pndkp.gov.pk/category/downloads/

Dixit et al., (2016) Climate finance: Fund flow from national to sub-national level in Nepal. ISET-Nepal, Kathmandu

Dongol Y, Heinen JT (2012) Pitfalls of CITES implementation in Nepal: a policy gap analysis. Environ Manag 50:181–190. https:// doi.org/10.1007/s00267-012-9896-4

Dutschke, M 2005. CDM Forestry and the ultimate objective of the climate change convention. Mitigation and Adaptation Strategies for Global Change (2007) 12: 275–302. DOI: 10.1007/s11027-005-9013-6.

Duraiappah, Anantha. Kumar. Exploring the Links. UNEP-IISD, 2004.

Duraiappah et al., (2007). Measuring Policy Coherence among the MEAs and MDGs Anantha Kumar Duraiappah and Asmita Bhardwaj, (January 2007).

ESP, 2015. Economic survey of Pakistan, ministry of finance government of Pakistan. http://www.finance.gov.pk/survey/chapters_15/02_Agricultre.pdf

ESP, 2016. Economic survey of Pakistan, ministry of finance government of Pakistan. http://www.finance.gov.pk/survey/chapters_16/02_Agriculture.pdf

ESP, 2018. Economic survey of Pakistan, ministry of finance government of Pakistan. http://www.finance.gov.pk/survey/chapters_18/02-Agriculture.pdf

Erol et al., 2017. A qualitative and quantitative analysis of Turkish forest policy documents in the rural development scope. Ciência Rural, Santa Maria, v.47: 06, e20151549, 2017.

FAO. (2009). Pakistan Forestry Study Outlook. Food and Agriculture Organization of The United Nations Regional Office for Asia and the Pacific Bangkok, 2009

FAO. 2010. Developing effective forest policy A guide. Food and Agriculture Organization of the United Nations Rome, 2010.

FAO. (2010). Global Forest Resources Assessment 2010 Country Report, Pakistan, 50. Food and Agriculture Organization of the United Nations Rome, 2010.

FAO. 2012. Forest Policies and the Status of Sustainable Forest Management on the Ground: What are the Links? by M. Gustafsson, C. Umemiya, E. Rametsteiner. Forestry Policy and Institutions Working Paper No. 28. Rome.

FAO. (2015). Global Forest Resources Assessment 2015 Country Report Pakistan, 70. Food and Agriculture Organization of the United Nations Rome, 2010.

FAO. (2016). Global Forest Resources Assessment 2015 How are the world's forest are changing? (second edi). Rome. Retrieved from http://www.fao.org/3/a-i4793e.pdf.

FAO FRA. (2012). Forest Resources Assessment 2015: Terms and Definitions. FAO Report, 36. Retrieved from http://www.fao.org/docrep/017/ap862e/ap862e00.pdf

Sandulescu et al., (2007). Policy analysis of a government-sanctioned management plan for a community-owned forest in Romania. Forest Policy and Economics, 10(1-2), 14-24.

Giessen et al., (2016). International and Domestic Sustainable Forest Management Policies: Distributive Effects on Power among State Agencies in Bangladesh. Sustainability. 8. 335. 10.3390/su8040335.

GoP, 2001. National Forest Policy 2001 of Pakistan Government of Pakistan Ministry of Environment, Local Government and Rural Development.

GoP, (2005) Supply and Demand of Fuel Wood and Timber for Household and Industrial Sectors and Consumption Pattern of Wood and Wood Products in Pakistan. Ministry of Environment, Government of Pakistan.

GoP, 2015. National Forest Policy 2015, ministry of climate change government of Pakistan. (http://www.mocc.gov.pk/moclc/userfiles1/file/National%20Forest%20Policy%202015%20(9-1-17).pdf).

GoP, 2017. Pakistan bureau of statistics census data 2017. http://www.pbs.gov.pk/sites/default/files/PAKISTAN%20TEHSIL%20WISE%20FOR%20WEB%20CENSUS_2017.pdf

Hassan, L. 2001, Analyzing Institutional Set-up of Forest Management in Pakistan, Pakistan Institute of Development Economics, Islamabad, Pakistan.

Hellström, E. 2001. Conflict cultures – Qualitative Comparative Analysis of environmental conflicts in forestry. Silva Fennica Monographs 2. 109 p.

Helvetas, (2011) Nepal's climate change policies and plans: Local communities' perspective environment and climate series 2011/1. HELVETAS Swiss Inter cooperation Nepal, Lalitpur.

Humphreys, D., 2006. Logjam: Deforestation and the Crisis of Global Governance. Earthscan. London, Sterling, VA.

Husch, B. (1987). Guidelines for forest policy formulation (No. Fe 81). FAO.

*Howlett et al., 2002. The policy effects of internationalization: a subsystem adjustment analysis of policy change. Journal of Comparative Policy Analysis **4**(1): 31–50.*

Jordan, Lenschow, A., 2010.Environmental policy integration: a state-of-the-art review. Environ. Policy Gov. 20 (3), 147–158.

Kalaba et al., (2014). Policy coherence and interplay between Zambia's forest, energy, agricultural and climate change policies and multilateral environmental agreements. International Environmental Agreements: Politics, Law and Economics, 14(2), 181–198. https://doi.org/10.1007/s10784-013-9236-z.

Kamal et al., (2019). Significance of Billion Tree Tsunami Afforestation Project and Legal Developments in Forest Sector of Pakistan. International Journal of Law and Society, 1(4), 157–165. https://doi.org/10.11648/j.ijls.20180104.13.

Kannine et al., (2007). Do trees grow on money? The implications of deforestation research for policies to promote REDD (Vol. 4). Cifor.

Kerlinger, F.N. (1986). Foundations of behavioural research (3rd ed), New York: Holt, Rinehart and Winston.

Kivimaa et al., Making the Climate Count: Climate Policy Integration and Coherence in Finland. Finnish Environment Institute: Helsinki.

Krott, M. (2005). Forest Policy Analysis; Springer: Dordrecht, The Netherlands, 2005.

Kureshi, K.U. 1997. Geography of Pakistan. Muhammad Amir National Book Service, Lahore.

ITTO (1990). ITTO Guidelines for the Sustainable Management of Natural Tropical Forests. Policy Development Series No. 1.

Lambini et al., 2013. A comparative analysis of the effects of institutional property rights on forest livelihoods and forest conditions: Evidence from Ghana and Vietnam. Forest Policy and Economics 38 (2014) 178–190. http://dx.doi.org/10.1016/j.forpol.2013.09.006.

Lenschow et al., 2002. Environmental Policy Integration. Greening Sectoral Policies in Europe. London, Sterling: Earthscan.

Locatelli et al., (2010) Forests and adaptation to climate change: Challenges and opportunities. In: Mery G, Kaltila P, Galloway G, Alfaro R, Kanninen M, Lobovikov M, Varjo J (eds) Forest and society: Responding to global drivers of change. IUFRO,

Lowe, W. (2004a). Yoshikoder: An Open Source Multilingual Content Analysis Tool for Social Scientists Yoshikoder as a Content Analysis Tool Using the Yoshikoder, 1–4.

Lowe, W. (2004b). Yoshikoder: An Open Source Multilingual Content Analysis Tool for Social Scientists Yoshikoder as a Content Analysis Tool Using the Yoshikoder. The American Political Science Association Meeting, (October), 1–4.

May et al., (2005). Policy coherence and component-driven policymaking: Arctic policy in Canada and the United States. Policy Studies Journal, 33(1), 37-63.

Millennium Ecosystem Assessment, 2005. Ecosystems and Human Well-being: Synthesis. Island Press, Washington, DC.

Ministry of climate change Pakistan. (2015). GOVERNMENT OF PAKISTAN.

Ministry of Environment and Forests (2009) National biodiversity action plan, New Delhi, India, MoEF, Government of India, p 100.

Muhammed et al., (2008). Forest policy and sustainable forest management in Bangladesh: An analysis from national and international perspectives. New Forests, 36(2), 201–216. https://doi.org/10.1007/s11056-008-9093-8.

Nazir et al., (2018). Forest Wood Consumption and Wood Shortage in Pakistan: Estimation and Projection through System Dynamics Forest Wood Consumption and Wood Shortage in Pakistan: Estimation and Projection through System Dynamics, (January 2019), 73–98. https://doi.org/10.30541/v57i1pp.73-98.

Neuman, W.L., 2006. Social Research Methods Qualitative and Quantitative Approach, Sixth ed. Pearson, USA.

Nilsson et al., (2012). Understanding Policy Coherence: Analytical Framework and Examples of Sector-Environment Policy Interactions in the EU. Environmental Policy and Governance, 22(6), 395–423. https://doi.org/10.1002/eet.1589.

Nkem et al., 2010) Shaping forest safety nets with markets: adaptation to climate change under changing roles of tropical forests in Congo Basin. Environ Sci Policy 13:498–508. https://doi.org/10.1016/j. envsci.2010.06.004.

Oberthu¨r et al., (2006a). Institutional interaction in global environmental governance. Cambridge, MA: The MIT Press.

OECD, 2002. Improving Policy Coherence and Integration for Sustainable Development: a Checklist. OECD: Paris

Pandey et al., (2016) Assessing the roles of community forestry in climate change mitigation and adaptation: A case study from Nepal. Ecol Manag 360:400–407. https://doi. org/10.1016/j.foreco.2015.09.040.

Park et al., (2014). Forest Policy and Law for Sustainability within the Korean Peninsula, 5162–5186. https://doi.org/10.3390/su6085162.

Parsad, B.D. (2008) Content analysis: a method in social science research. In: BHASKARAN Lal Das,

D.K. (Ed.). Research methods for social work. New Delhi: Rawat Publications, 2008. p.173-193 https://doi.org/10.13140/RG.2.1.1748.1448.

Punjab development statistics, Bureau of statistics Punjab, Government of Punjab. http://bos.gop.pk/developmentstat.

Ranabhat et al., (2018). Policy coherence and interplay between climate change adaptation policies and the forestry sector in Nepal. Environmental management, 61(6), 968-980.

Ravnkilde et al., (2010). Pathways for Implementing REDD + Experiences from Carbon Markets and Communities.

Sabatier, Paul A. 1988. "An Advocacy Coalition Framework of Policy Change and the Role of Policy Oriented Learning therein". Policy Sciences, vol. 21, 129-168.

Sadath, M.N., 2012. Identifying policy change — Analytical program analysis: An example of two decades of forest policy in Bangladesh. Forest Policy and Economics 25 (2012) 93–99

SAFI, 2000. Charter of Demands. Sarhad Awami Forestry Ittehad. Sungi Development Foundation, Islamabad, Pakistan

Sarah et al., (2016) Dismantling Comprehensive Forest Bureaucracies: Direct Access, the World Bank, Agricultural Interests, and Neoliberal Administrative Reform of Forest Policy in Argentina, Society & Natural Resources, 29:4, 493-508, DOI: 10.1080/08941920.2015.1089608.

Syampungani et al., (2009). The miombo woodlands at the cross-roads: Potential threats, sustainable livelihoods, policy gaps and challenges. Natural

Shahbaz et al., (2007). A CRITICAL ANALYSIS OF FOREST POLICIES OF PAKISTAN, 441–453. https://doi.org/10.1007/s11027-006-9050-9.

Siddiqui, K. M. (1997). ASIA-PACIFIC FORESTRY SECTOR OUTLOOK STUDY.

SINGER, B. (2008). Putting the National back into Forest-Related Policies: The International Forests Regime and National Policies in Brazil and Indonesia. The International Forestry Review, 10(3), 523-537. Retrieved from http://www.jstor.org/stable/43739787.

Singh et al., (2017). Forest Policy and Economics Forest transition and socio-economic development in India and their implications for forest transition theory ☆. Forest Policy and Economics, 76, 65–71. https://doi.org/10.1016/j.forpol.2015.10.013

Soo et al., (2012). Land Use Policy Forest transition in South Korea: Reality, path and drivers. Land Use Policy, 29(1), 198–207. https://doi.org/10.1016/j.landusepol.2011.06.007

Stempel, G.H. (1989). Content analysis. In G.H. Stempel and B.H. Westley (Eds) Research methods in mass communications, Englewood Cliffs NJ: Prentice-Hall

Sun & yeo-Chang, (2017). Forest Policy and Economics Reforestation policy integration by the multiple sectors toward forest transition in the Republic of Korea ☆. Forest Policy and Economics, 76, 45–55. https://doi.org/10.1016/j.forpol.2016.05.019.

The Khyber Pakhtunkhwa forest, ordinance 2002, Ordinance No. Xix of 2002. An ordinance to consolidate and amend the laws relating to protection, conservation, management, and sustainable development of forests and natural resources in the Khyber Pakhtunkhwa, 10th June 2002.

UN. (1992). Rio Declaration on Environment and development 1992, 6.

UN. (1998). Kyoto Protocol to the United Nations Framework Kyoto Protocol to the United Nations Framework. Review of European Community and International Environmental Law, 7, 214–217. https://doi.org/10.1111/1467-9388.00150.

UNFF. (2001). United Nations Forum on Forests Report on the organizational and first sessions. https://documents-dds-sny.un.org/doc/UNDOC/GEN/N01/539/81/PDF/N0153981.pdf?OpenElement.

UNFF. (2006). United Nations Forum on Forests Report of the sixth session (27 May 2005 and 13 to 24). https://documents-dds-ny.un.org/doc/UNDOC/GEN/N06/268/51/PDF/N0626851.pdf?OpenElement.

UNFF. (2007). UN Forest Instrument, Report- UNFF 7th Session, (22), 1–11.

UNGA. (2017). United Nations strategic plan for forests, 2017 - 2030 Introduction Vision and Mission Importance of forests to people and the 2030 Agenda for Sustainable Development, 15, 2017–2030.

UNFF. (2018). Monitoring, assessment and reporting on progress towards implementing the United Nations strategic plan for forests 2017–2030, including the United Nations forest instrument and voluntary national contributions. United Nations Forum on Forests, thirteen session 2018.

Virtanen, P. (2002). The role of customary institutions in the conservation of biodiversity: Sacred forests in Mozambique. Environmental Values, 11(2), 227–241.

Volkery et al., (2012). Mapping the Landscape of EU Environmental Policy: Coherence and Linkages. SSRN Electronic Journal, (December). https://doi.org/10.2139/ssrn.2017563.

World Bank, (2018). THE WORLD BANK ENVIRONMENT AND NATURAL RESOURCES GLOBAL PRACTICE SOUTH ASIA REGION FORESTS FOR GREEN PAKISTAN: FOREST POLICY NOTE, (June).

Worrel, A. C. (1970). Principles of forest policy. McGraw Hill.

WANG, S. (2001). Towards an international convention on forests: Building blocks versus stumbling blocks. The International Forestry Review, 3(4), 251-264. Retrieved from http://www.jstor.org/stable/42609402.

Young O. 2002. The Institutional Dimensions of Environmental Change: Fit, Interplay, and Scale. MIT Press: Cambridge.

Yurdakul et al., (2017). A qualitative and quantitative analysis of Turkish forest policy documents in the rural development scope, 1–9.

Yusuf, M. (2009). Legal and Institutional Dynamics of Forest Management in Pakistan, 5(1), 45–71. Retrieved from http://climateinfo.pk/frontend/web/attachments/data-type/Yusuf (2009) Legal and Institutional Dynamics of Forest Management in Pakistan.pdf.

Zhang et al., (1998). What's the relative risk? A method of correcting the odds ratio in cohort studies of common outcomes. JAMA, 280 19, 1690-1.

Zingerli et al., (2014). Towards Policy Integration: Experiences with intersectoral coordination in international and national forest policy, (December 2004). https://doi.org/10.5167/uzh-76909.

9 Appendices

Questionnaires developed to collect data related to thematic areas of international forest policies

9.1 Reverse of forest loss

Province govt sector data

Province	Total forest area (0000 ha)		Afforested/Reforested (0000 ha)		Restored (0000 ha)		Deforested (0000 ha)		Total change (0000 ha)		Net forested area (0000 ha)	
	2010	2018	2010	2018	2010	2018	2010	2018	2010	2018	2010	2018
KPK												
Punjab												
Sind												
Baluchistan												
G. Baltistan												
total												

9.2 Enhanced forests-based benefits

Enhanced forest-based benefits

Province	Forest dependent people Number in million		No of heads employed Number in million		beneficiaries of SFE number in (0000)		Economic benefits Million Rupees		Biomass produced Metric Tonnes	
	2010	2018	2010	2018	2010	2018	2010	2018	2010	2018
KPK										
Punjab										
Sind										
Baluchistan										
G. Baltistan										
Total										

9.3 Increase sustainable forest management

Increased sustainable forest management

Year/Province	Total Forest area (0000) ha		Protected forest area (0000) ha		Reserved forests areas (0000) ha		Area under Guzara Forests (0000) ha		Area under section 38 (0000) ha		Area under Private forests (0000) ha		Other (0000) ha	
	2010	2018	2010	2018	2010	2018	2010	2018	2010	2018	2010	2018	2010	2018
KPK														
Punjab														
Sind														
Baluchistan														
G. Baltistan														
Total														

9.4 Mobilization of financial resources

Mobilization of financial resources

Resource allocated	Source of Funding													
	International		National		Provincial									
					KPK		Punjab		Sind		Baluchistan		Gilgit-Baltistan	
	Countries/Institutions	NGOs	Government	NGOs	Govt. Sector	NGOs	Govt. Sector	NGOs	Govt. Sector	NGOs	Govt. Sector	NGOs	Govt. Sector	NGOs
million Rupees	Million Rupees	Million Rupees	Million Rupees	Million Rupees	Million Rupees	Million Rupees	Million Rupees	Million Rupees	Million Rupees	Million Rupees	Million Rupees	Million Rupees	Million Rupees	Million Rupees

9.5 Linear Interpolation Method:

FRA Category	Area (1000) ha	
	1992	2002
Forest	1770	1740

STEP 1: Calculate the annual change Time difference between observations (2002-1992 = 10 years)

Difference between observed values (1 740 000-1 770 000 = -30 000 ha)

Difference per year of annual change (-30 000/10 = -3 000 ha per year)

STEP 2: Estimation and forecasting using linear interpolation and extrapolation

2a linear interpolation for the year 2000= Value for 2002+ (difference in years between 2000 and 2002 * difference per year)1 740 - (2*-3 000) = 1 746 000 ha

2b linear extrapolation for the year 2010= Value for 2002 +(difference in years between 2010 and 2002 * difference per year) 1 740 + (8*-3 000) = 1 716 000 ha

9.6 Outcome of questionnaire survey to devise logical framework for coding in software for content analysis

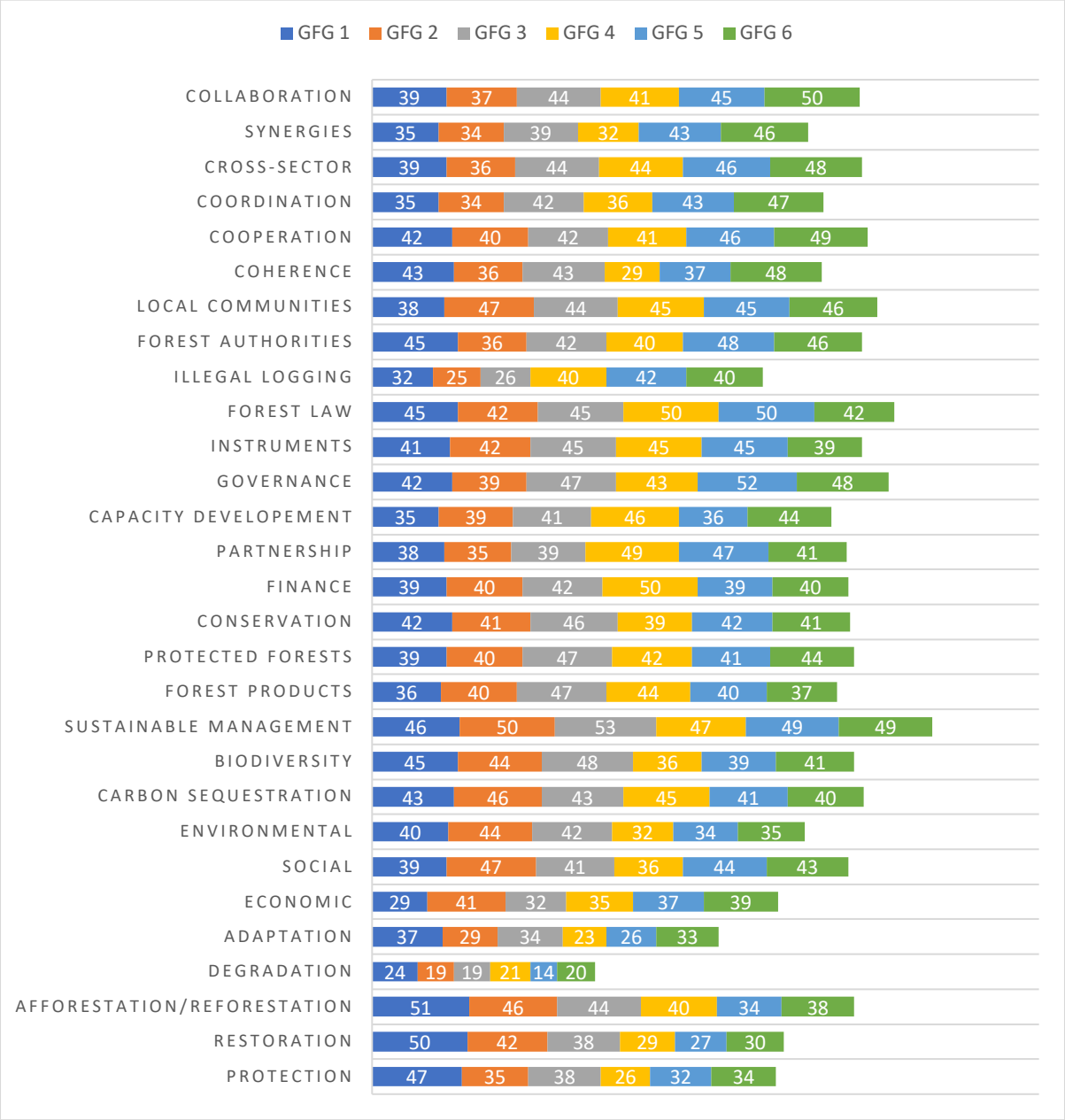


Figure 25 Representing the result of questionnaire survey for the development of framework to use key terms in as input file in software to perform content analysis