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Internal Control Framework for IFAD Investments

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Abbreviations and acronyms

ACD	Accounting and Controller's Division
AVP/FOD	Associate Vice-President, Financial Operations Department
CM	Cash Management team
COSO	Committee of Sponsoring Organizations of the Treadway Commission
CVaR	Conditional Value at Risk
ERM	Enterprise Risk Management
FISCO	Investment and Finance Advisory Committee
FMD	Financial Management Services Division
FOD	Financial Operations Department
ICF	Internal Control Framework
IFI	International Financial Institution
IM	Investment Management team
IPS	Investment Policy Statement
MLR	minimum liquidity requirement
PPL	Portfolio Planning Team
RCF	Risk and Compliance Function
TRE	Treasury Services Division

Preamble

1. The Internal Control Framework (ICF) for IFAD Investments was first presented to the 104th Executive Board in December 2011 in conjunction with IFAD's Investment Policy Statement (IPS). While the IPS provides an overall framework for the management of IFAD investments, the ICF provides additional information pertaining to the internal control structures in place.
2. The first annual review of the IPS was presented for approval at the 107th session of the Executive Board in December 2012. Prior to that session, at its 125th meeting in November 2012, the Audit Committee requested that the annually revised ICF accompany the annually updated IPS for completeness.

Internal Control Framework for IFAD Investments

I. Overview of internal control best practices

1. Internal controls form an integral part of any organization's financial and business policies and procedures. The Internal Control Framework (ICF) for IFAD Investments is based on the widely used Internal Control – Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (the COSO Framework). Although not independently audited or certified in compliance with the COSO Framework, the ICF refers to the COSO Framework for guidance on format.
2. The COSO Framework sets out five components with 17 associated principles. These components are defined as follows:
 - (i) Control environment: organizational values and culture; policies; organizational structure. The control environment is the foundation for all other components of internal control;
 - (ii) Risk assessment: identification and measurement of threats, and responses to them;
 - (iii) Control activities: the policies and procedures that help ensure management directives are carried out;
 - (iv) Information and communication: reliability, timeliness, clarity, usefulness; and
 - (v) Monitoring activities: processes used to assess the quality of internal control performance over time.
3. This paper describes how these five components pertain to activities related to the ICF. Section II focuses on aspects of the control environment, specific organizational structure, and roles and responsibilities of the various key players. Section III describes the risk assessment, control, information and communication, and monitoring activities.
4. Annex II links the 17 COSO Framework principles to various investment-related policies and procedures as well as to relevant sections of the ICF itself.

II. Control environment: Organizational structure, roles and responsibilities

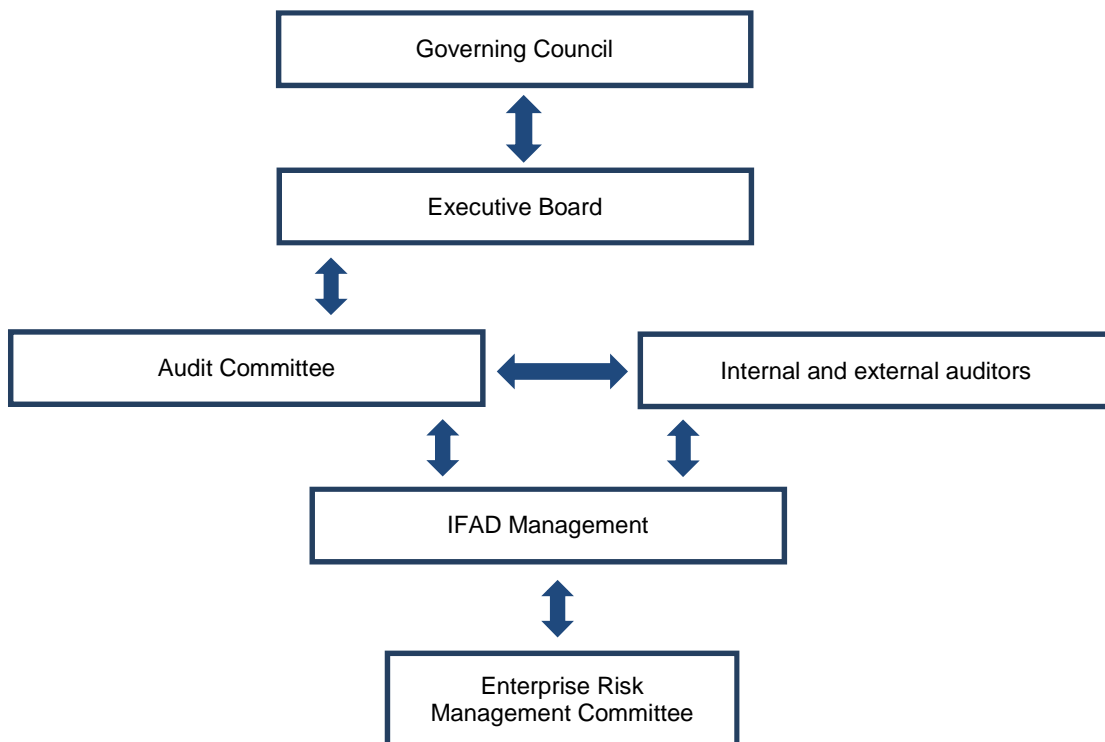
A. Actors and their roles

5. According to the Framework, everyone in an organization has responsibility for internal control to some extent. Virtually all employees produce information used in the internal control system or take other actions needed to effect control. This responsibility extends to corporate governance, and translates, in the case of IFAD, to the following roles:
 - (i) The Governing Council, which is the supreme plenary organ of the Fund. It is composed of representatives of the Member States. All powers of the Fund are vested in the Governing Council. Subject to the limitations stated in the Fund's charter, it may delegate powers to the Executive Board.
 - (ii) The Executive Board, and the Audit Committee, which is appointed by the Board, supervise internal control and risk management. Assisted by the Audit Committee, the Board is informed and updated on any changes to the operating principles of internal control including the main features of the risk management process, a summary of risks, control objectives and common control points for financial reporting.
 - (iii) The internal and external auditors of the organization also measure the effectiveness of internal control. They assess whether the controls are properly

designed, implemented and working effectively while making recommendations on how to improve internal control.

- (iv) Management is responsible for designing, approving and implementing the internal control and risk management process together with the Fund's financial operations management team.
 - (v) The Enterprise Risk Management (ERM) Committee¹ is responsible for supporting and overseeing the risk management activities of the Fund. It is a critical element for the management of operational risk as it affects the investment activities of the Fund.
6. IFAD's Management and staff are committed to IFAD's Code of Conduct,² which was established to regulate their conduct and align it with the interests of IFAD.
7. The governance structure and reporting lines are presented in Chart 1.

Chart 1
Governance structure



8. Part B of this section examines in detail the flow of financial information within IFAD, the internal actors involved in the process of investment decision-making, and the specific roles and responsibilities, as well as the flow of financial information as per chart 2.

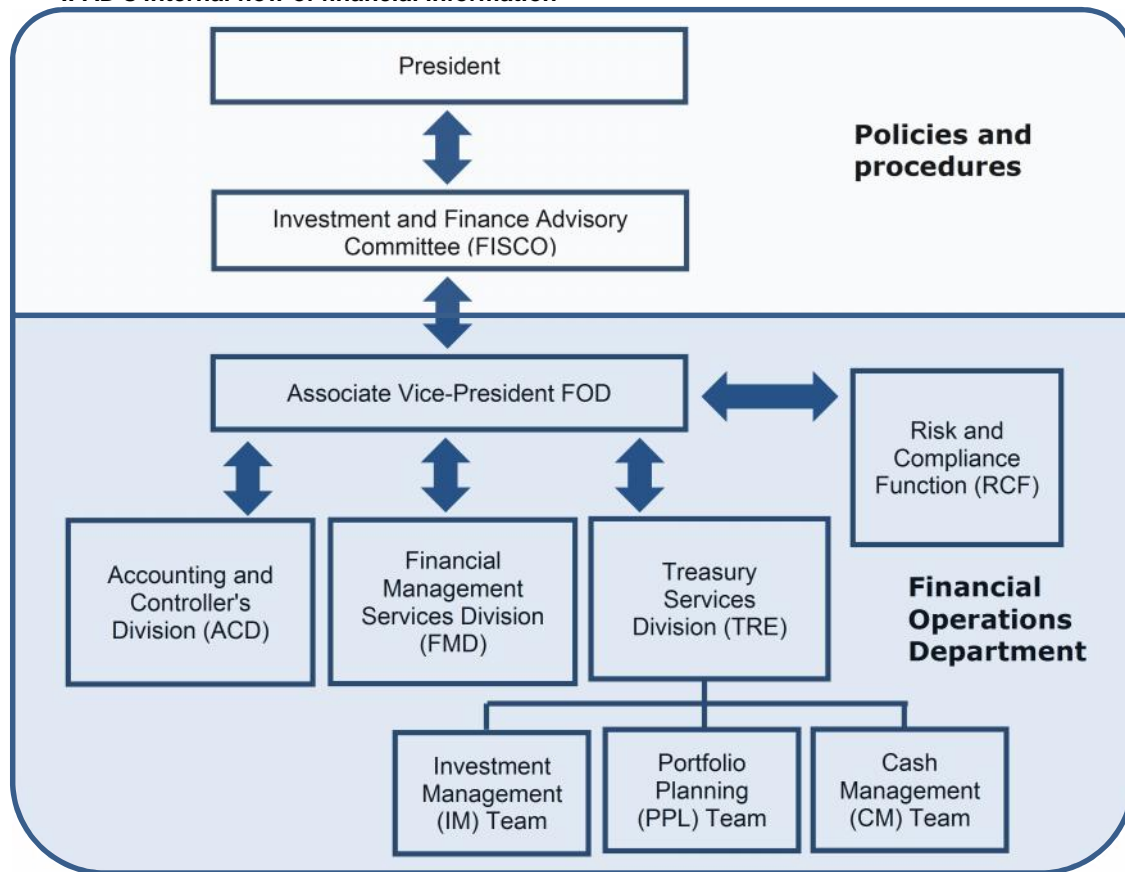
¹ See PB 2008/06.

² IFAD Human Resources Implementing Procedures – Chapter 1: Duties, obligations and privileges 1.7.9(vi).

B. Investment-related roles and responsibilities in IFAD

9. IFAD's internal flow of financial information in terms of investments is presented in chart 2.

Chart 2
IFAD's internal flow of financial information



10. President. The President has oversight and decision-making responsibility for the investment of the assets based on the approved IPS. He or she may delegate authority for specific investment-related activities.
11. Investment committees. There are two investment committees charged with the supervision and oversight of the various financial matters of the organization:
- The Investment and Finance Advisory Committee (FISCO) – the high-level committee. The rules of procedure and terms of reference of FISCO are presented in annex I; and
 - The FOD Management Team (FODMT) – assists and advises the Associate Vice-President, Financial Operations Department (AVP/FOD) in making decisions on financial or investment management matters under his/her authority or under specific delegation of authority from the President of IFAD. The FODMT will provide strategic recommendations to FISCO for final decision by the President.
12. Associate Vice-President, Chief Financial Officer and Chief Controller (AVP/FOD). As head of the Financial Operations Department (FOD), the AVP/FOD is responsible for IFAD's financial resource management. Through the Accounting and Controller's Division (ACD), the Financial Management Services Division (FMD), the Treasury Services Division (TRE) and the Risk and Compliance Function (RCF), the AVP/FOD:

- (i) Manages and reports on IFAD's financial resources in a framework of cost efficiency, risk containment, transparency and accountability;
 - (ii) Invests and manages financial assets not immediately needed, in line with operational requirements;
 - (iii) Safeguards and maximizes the resources available for operations through prudent financial management and investment of financial resources, and through appropriate accounting, reporting and projection on IFAD's use of these resources; and
 - (iv) Works with internal and external partners in sharing knowledge, harmonizing financial management systems and procedures, and/or enabling their collaboration.
 - (v) Performs functions delegated by the President, including the update of the investment guidelines.
13. Accounting and Controller's Division (ACD). ACD is responsible for the accounting and reporting of the Fund. It must ensure integrity, transparency and control of the management of IFAD's resources, including trust funds, supplementary funds, funds of hosted entities and funds raised through innovative financing-related activities. The division provides leadership and interpretation on all major issues related to the formulation and implementation of accounting policies and procedures, such as adoption of new International Financial Reporting Standards (IFRS). The main specialized services provided by ACD are the following:
- (i) Maintaining adequate internal control systems to ensure that all IFAD's financial transactions are properly, completely and accurately recorded and reported, and are consistent with IFAD's Framework for Delegation of Authority and its policies and procedures and are in accordance with IFRS;
 - (ii) Compiling accurate and timely internal and external financial reports that reflect and capture all the Fund's financial transactions and results, and the overall financial position;
 - (iii) Originating governing body and other official documents on financial matters, e.g. financial statements and draw-down requirements;
 - (iv) Monitoring and strengthening financial management and fiduciary responsibilities for IFAD's fund flows, supplementary funds administration, audit and reporting;
 - (v) Ensuring financial and budgetary management of extra budgetary funds and hosted entities; and
 - (vi) Liaising with the external auditors and the Audit Committee.
 - (vii) Ensuring operational risk management/controllership.
14. Financial Management Services Division (FMD). FMD is a specialized division responsible for promoting and directly supporting the strengthening of financial management practices in IFAD-financed operations, including financial reporting, project audits, project liquidity management and fiduciary compliance throughout the project lifecycle. The division manages IFAD's financial management workforce, which includes IFAD staff and a roster of accredited financial management consultants. The division is structured to:
- (i) Mainstream financial management procedures to form an integral part of the development process in all IFAD-financed and -managed operations to ensure that funds are used for the intended purpose. FMD achieves this through the provision of risk-based financial direction and oversight during the preparation and implementation of country strategic opportunities programmes and during

the design, supervision and implementation support of IFAD projects, programmes and grant activities;

- (ii) Provide corporate advisory and financial services for operational policies and procedures, including but not limited to: IFAD financing terms and criteria, debt issues, risk management and financial administration;
 - (iii) Interact with international accounting and auditing bodies and donor partners, where desirable, to help countries strengthen their financial management capacity;
 - (iv) Engage IFAD's external stakeholders, including governments, projects, project staff and auditors, as well as IFAD's workforce (including accredited consultants) to promote financial management knowledge-sharing and capacity-building;
 - (v) Lead financial management system and tool development, including direct engagement with borrowers/recipients to facilitate the roll-out of IFAD's e-disbursement system, the IFAD Client Portal; and
 - (vi) Maintain strategic partnerships with other international financial institutions (IFIs) and multilateral platforms to promote sharing of best practices and to harmonize IFAD's financial management policies and operational practices where applicable and desirable.
15. Treasury Services Division (TRE). TRE has a key fiduciary role in managing IFAD's liquidity and the cash flows of both replenishment-based and borrowed resources. This includes strategic portfolio and liquidity planning and long-term financial projections of cash flows and resources. The specialized services provided by TRE are designed to:
- (i) Formulate and implement financial policies and procedures, including the investment policy;
 - (ii) Manage IFAD's operational cash and liquidity requirements for all funding sources;
 - (iii) Actively manage IFAD's investment portfolio;
 - (iv) Coordinate strategic portfolio and liquidity planning by setting the minimum liquidity requirement (MLR) and the resources available for commitment;
 - (v) Develop partnerships with the treasuries of other IFIs regarding the cash flow processes of disbursements and receipts through operational bank accounts.
16. TRE relies on three operating teams to deliver these services:
- A. The Cash Management (CM) and Back Office team provides both cash management and post-trading services on investments. Responsibilities are to:
- (i) Manage and report on all cash flow operations and short-term liquidity of operational portfolios;
 - (ii) Ensure accurate processing for all financial and payments transactions in operational bank accounts in compliance with relevant regulations and industry standards;
 - (iii) Ensure accurate reconciliation of all financial transactions in IFAD and non-IFAD non-investment operational accounts;
 - (iv) Initiate liquidity transfers between IFAD operational accounts to provide liquidity, and initiate requests for internal replenishments for Investment Management (IM) team action;

- (v) Execute post-trade processing and investment settlement activities for all financial transactions traded by the IM team for the internally managed portfolios;
 - (vi) Develop, manage and maintain relationships with central and commercial banks, and IFAD's global custodian regarding cash flow operations for headquarters and IFAD Country Office accounts;
 - (vii) Manage TRE's activities in support of IFAD's decentralization, including negotiating banking arrangements and providing support for local bank accounts;
 - (viii) Manage electronic fund transfer systems and cash management systems.
- B. The Investment Management team monitors and manages IFAD's internally and externally managed portfolios. Responsibilities are to:
- (i) Directly manage the internal portion of the investment portfolio. This involves market research, credit analysis of issuers, trade execution and optimal portfolio construction;
 - (ii) Periodically review IFAD's investment policy and guidelines to ensure alignment and compliance with IFAD's investment strategies, in light of changing financial and market conditions;
 - (iii) Oversee and analyse the externally managed portion of the investment portfolio;
 - (iv) Implement currency and asset allocation of the overall investment portfolio;
 - (v) Implement foreign exchange and interest rate risk hedges;
 - (vi) Manage IFAD's relationships with trading counterparties, external fund managers and, jointly with CM, the global custodian;
 - (vii) Ensure the availability of funds for IFAD and non-IFAD operations through prudent liquidity management in collaboration with CM.
- C. The Portfolio Planning (PPL) team coordinates strategic portfolio and liquidity planning. Responsibilities are to:
- (i) Formulate and implement financial policies and procedures;
 - (ii) Produce short-term (1 to 3 years) portfolio cash flow projections;
 - (iii) Analyse and recommend the minimum liquidity requirement (MLR);
 - (iv) Produce long-term financial/resource projections and scenarios. In this regard, the team is responsible for managing and enhancing IFAD's financial model;
 - (v) Determine the resources available for commitment based on a sustainable cash flow approach;
 - (vi) Analyse investment performance versus the applicable benchmarks, including the construction and calculation of benchmarks for internally managed portfolios;
 - (vii) Manage and administer the pre-trade compliance system and intradivisional workflow automation.
17. The Risk and Compliance Function (RCF) unit reports directly to the AVP/FOD. This direct reporting line ensures segregation of duties of investment risk management from the investment function performed in TRE. Responsibilities are to:

- (i) Actively monitor, analyse and periodically report on IFAD's investment risk budget;
- (ii) Liaise with TRE and provide credit risk analysis on existing and proposed investments;
- (iii) Contribute to setting and managing the Fund's risk budget on an ongoing basis by monitoring, analysing and reporting on financial risk exposure and by identifying potential new risk factors in IFAD's investments;
- (iv) Perform stress tests and scenarios and propose mitigation strategies;
- (v) Oversee the global custodian compliance monitoring system to ensure correct alignment with all investment guidelines;
- (vi) Provide advice on potential risks to IFAD's financial soundness based on extended knowledge of IFI best practice and, inter alia, capital adequacy, credit and liquidity ratios;
- (vii) Monitor adherence to the established capital adequacy ratios;
- (viii) Provide periodic investment risk and compliance reports to the AVP/FOD and Senior Management; and
- (ix) Supply input for technical and operational support provided by FOD front office to the AVP/FOD as requested.
- (x) Review and update the investment guidelines

C. Investment policies and procedures

18. The overall framework for IFAD's investment processes and controls is set by the following policies, and procedures:

- Financial Regulations of IFAD;
- IFAD Policy on ERM;³
- IFAD's Investment Policy Statement;
- IFAD's Liquidity Policy;⁴
- IFAD's investment guidelines;
- ICF for IFAD Investments;
- International Financial Reporting Standards;
- Investment management and master custody agreements;
- Treasury Manual;
- Rules of procedure and terms of reference of FISCO, referred to in annex I;

19. Financial Regulations of IFAD. The Financial Regulations of IFAD govern the financial administration of the Fund and are interpreted in accordance with the Agreement Establishing IFAD.

20. IFAD Policy on ERM. The ERM policy establishes a formal, systematic and integrated approach to identifying, managing and monitoring operational, financial and compliance risks in IFAD and defines key roles and responsibilities for all stakeholders in ERM activities. Certain activities performed under IFAD's ERM relevant to the Fund's investments include:

- (a) Annual certification of compliance with the code of conduct and declaration of non-IFAD income, goods, services or assets. Consistent

³ See EB 2008/94/R.4.

⁴ See EB 2006/89/R.40.

with IFAD's Code of Conduct,⁵ all staff members are required to submit an annual certification form declaring: (i) compliance with the Code of Conduct; (ii) conflicts of interest; and (iii) all sources of non-IFAD income, goods, services or assets.

- (b) Management assertion and external audit attestation⁶ of internal controls over financial reporting. Since 2011, IFAD has issued an annual Management assertion on the effectiveness of internal controls over financial reporting, while the first independent attestation from external auditors was received for the financial year 2012, now reported on a yearly basis within the audited consolidated financial statements.
 - (c) Financial disclosure statement for selected staff members. Since 2012 selected staff members, based on their role and responsibilities, are also required to submit a detailed financial disclosure statement.⁷
21. IFAD's Investment Policy Statement. The IPS is updated annually by TRE and approved by the AVP/FOD. It is then submitted to the Executive Board for final approval at its December session. The document provides the overarching principles regulating IFAD's key investment responsibilities, investment universe and acceptable risk parameters.
22. Specifically the IPS aims to:
- (i) Define the duties, responsibilities and governance over IFAD's investments;
 - (ii) Set out IFAD's investment objectives for risk and return, including eligible asset classes;
 - (iii) Define key components of investment guidelines;
 - (iv) Determine the risk budget for IFAD's overall investment portfolio; and
 - (v) Establish formalized criteria to measure, monitor and evaluate performance and risk.
23. IFAD's Liquidity Policy.⁸ This policy provides a "means of monitoring and ensuring that the Fund has adequate liquidity available at all times".
24. IFAD investment guidelines. For each individual portfolio, IFAD's investment guidelines define the principles by which a fund is managed and monitored. The RCF unit, through daily oversight and monitoring, ensures strict compliance with investment guidelines through the compliance monitoring system provided by IFAD's global custodian. In June 2018 the investment guidelines were updated and standardized to the extent possible in light of diverse investment parameters of the various portfolios. The investment guidelines now require a yearly review by the ICF and, if changes are made, subsequent approval by the AVP,FOD .
25. These investment guidelines include at least the following components for each portfolio:
- (a) Investment objectives: defining expected return and risk;
 - (b) Risk budget (tracking error, etc.);
 - (c) Base currency;
 - (d) Eligible currencies;
 - (e) Eligible instruments;

⁵ IFAD's Human Resource Implementing Procedures – Chapter 1: Duties, obligations and privileges 1.7.9(vi).

⁶ EB 2010/99/R.30.

⁷ IFAD Information Circular IC/ETH/01/2012 paragraph 3(b).

⁸ See EB 2006/89/R.40.

- (f) Minimum and maximum portfolio duration;
 - (g) Minimum credit quality;
 - (h) Diversification requirements;
 - (i) Procedures for futures and options; and
 - (j) Comparative performance benchmark.
26. The benchmarks identified in the investment guidelines must be: (i) unambiguous, transparent and simple; (ii) investable and replicable; (iii) measurable and stable; (iv) appropriate to the investment purpose; (v) reflective of current investment opinions; and (vi) specified in advance.
27. Investment management and master custody agreements. The agreements with external parties ensure that the relationship falls within a verified and constantly updated legal framework.
28. Treasury Manual. This manual provides a detailed description of the specialized services provided by TRE, and defines how the Division's workload is divided among its various functions.
29. The manual is divided into two main sections: (i) the executive manual, providing a broad overview of the organization and its major processes; and (ii) the operational manuals (cash management and investment management), which constitute a working document that provides the user with specific details, descriptions and examples of processes and procedures. Table 1 gives an overview of the Treasury Manual.

Table 1
Overview of the Treasury Manual

	<i>Executive manual</i>	<i>Operational manuals</i>
What is it?	An overview document that provides a concise description of TRE's functions and procedures in a summary format.	A detailed description of the functions, tasks and processes that make up the responsibilities of TRE staff.
How is it used?	Contains embedded navigation links that take the user directly to relevant sections within the operating manual for additional information.	Contains specific listings of duties, activities, detailed process flows, and other 'how-to' material. Can be used as a step-by-step instruction guide for most procedures.
Who are the prospective users?	Intended for use as a quick reference for those interested in how TRE operates and what its major functional responsibilities are.	Intended for use as a detailed reference for those tasked with carrying out TRE's day-to-day functions.

30. To maintain flexibility, accessibility and adaptability, the Treasury Manual is published on IFAD's local area network in portable document format (PDF). The electronic file is controlled by the TRE front office. In view of the constant revision of processes and the restricted nature of parts of the Treasury Manual, no hard copies are distributed.
31. Confidentiality. Due to the confidential nature of the information presented, parts of the Treasury Manual are restricted and can be viewed by authorized users only. Approved users may not divulge its contents to third parties without specific written permission by authorized senior staff. The public sections of the manual, i.e. the IFAD Treasury Executive Manual, are available to be viewed by all staff on the TRE intranet site.
32. Investment committees. IFAD has two investment committees – FISCO and FODMT – as elaborated upon in annex I.

III. Risk assessment, control, information and communication, and monitoring activities

A. Risk identification

33. IFAD's investments are exposed to a variety of financial risks. Marked-to-market investments are affected by market risks, as well as liquidity, credit, counterparty and operational risks. A detailed definition of these risks and a summary of the key measures used to measure such risks in IFAD's investment portfolio are given below.
34. Market risks
Market risk is defined as the risk of losses arising from exposure to changes in financial market variables (prices and rates). IFAD is exposed to changes in interest and exchange rates.
35. Interest rate risk is defined as the potential risk that the value of a fixed rate security will decline as a result of an upward movement in the absolute level of interest rates, based on the spread between the two rates, and the overall shape of the yield curve. Interest rate risk is monitored on the overall portfolio and on the individual portfolios. Risk measurements include duration, standard deviation, ex ante tracking error (active risk), value at risk and conditional value at risk (CVaR).
36. Currency risk arises from the change in price of one currency against another. IFAD faces currency risk as its future commitments may be in different currency to that of its assets. Currency risk is monitored, and reported on, on a monthly basis.
37. Liquidity risk is defined as the risk stemming from the lack of marketability of an investment that cannot be readily sold in the secondary markets to generate the necessary liquidity to meet contractual obligations. At any point in time, IFAD must be able to meet its disbursement obligations for loans and grants.
38. The liquidity risk is addressed through the MLR.⁹ This amount must be available at any point in time to ensure IFAD's ability to meet its disbursement obligation promptly and without additional costs.
39. Credit risk is defined as the risk of loss of the loan principal or loss of a financial reward stemming from a borrower's failure to repay a loan or otherwise meet a contractual obligation.
40. Credit risk is actively managed by the RCF unit in coordination with TRE and ACD. The minimum rating floors in the respective investment guidelines are an indicator of risk and used as a tool in managing credit risk. The eligibility of individual securities and issuers is determined on the basis of ratings given by the three major credit rating agencies Fitch, Moody's, and Standard and Poor's. Credit analyses by security and issuer are performed on an ongoing basis by TRE in conjunction with the RCF unit for all internally managed investments. In addition, such analyses, on a selective basis, are carried out on externally managed assets and commercial and central banks, through the use of financial information systems, credit analysts and other related sources. Moreover with the adoption of the impairment requirement of IFRS 9, an impairment allowance has been set up to reflect the expected credit loss of financial instruments designated at amortized costs. Monitoring activities of this credit risk are performed by ACD in conjunction with TRE and RCF.
41. Counterparty risk/trading counterparties
Counterparty risk is defined as the risk to each party of a contract that the counterparty will fail to perform its contractual obligations.

⁹ See EB 2006/89/R.40 and EB 2013/110/R.15.

42. Counterparty risk is managed for all investments through the establishment of a minimum rating for eligible counterparties, including banks for operational cash and for short-term investments and trading counterparties.
43. Counterparty risk is also managed by capping exposure to each issuer/bank. Counterparty risk analyses are performed internally for the purpose of trading and short-term investments with banks; in the case of commercial and central banks, financial information systems, credit analysis providers and other sources are used.
44. Country risk
Country risk is a collection of risks associated with investing in a country. These risks include political risk, exchange rate risk, economic risk, sovereign risk and transfer risk.
45. Country risk is managed for all investments through the establishment of maximum country exposure concentrations within the guidelines of every individual portfolio. Country exposures are monitored on a daily basis through the internal compliance system.
46. Industry (or sector) risk
This is the risk related to investing in a specific industry or sector. This risk is addressed by ensuring industry and sector diversification and by setting concentration limits in the investment guidelines.
47. Operational risk
Operational risk is defined by the Basel Committee on Banking Supervision as "the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events." Operational risk is the risk which is not inherent in financial, systematic or market-wide risk. This includes legal risk and reputational risk.
48. Operational risk is addressed by defining a sound framework of responsibility and accountability within IFAD's financial structure, by establishing back-up procedures and by performing legal reviews of all official policies.
49. On a broader organizational level, IFAD's Policy on Preventing Fraud and Corruption in its Activities and Operations¹⁰ aims to: "(i) affirm and communicate the Fund's resolve to prevent and combat fraud and corruption in its activities and operations; (ii) describe the ongoing efforts of the Fund in this area; and (iii) outline actions that the Fund will be taking in implementing this policy".
50. In addition, IFAD's Human Resources Implementing Procedures specify that "Screening will be conducted with professional rigour ... and selection processes ensuring that candidates are assessed on the basis of the highest standards of competence, integrity, and appropriate experience to carry out IFAD's objectives and avoid potential conflicts of interest".¹¹

B. Risk measurement and management

Risk budgeting and risk tolerance

51. The aforementioned points are addressed through a risk-budgeting framework which represents the overall risk appetite and tolerance of the organization. This translates into risk metrics as defined in the IPS, investment guidelines, liquidity policy as well as other policies and internal procedures.
52. Specifically, risk budgeting is the procedure of allocating risk within and between funds. It entails setting predetermined limits for the investment portfolio – on an aggregate level and at the level of individual managers – monitoring these

¹⁰ See EB 2005/85/R.5 and subsequently revised EB 2005/86/INF.8.

¹¹ IFAD's Human Resources Implementing Procedures, chapter 2: Staff recruitment and appointment 2.3.1 (ii).

measures and adjusting the portfolio whenever they exceed the tolerance level. In more detail, risk budgeting is the process of:

- (i) Measuring and decomposing the aggregate risk of a portfolio into its constituents on a quantitative basis;
 - (ii) Setting risk limits (risk budgets) for the overall investment portfolio and individual portfolios, ex ante through the definition of ranges of selected risk metrics in line with the organization's risk appetite and tolerance level;
 - (iii) Allocating risks across the assets in compliance with risk budgets;
 - (iv) Monitoring the use or misuse of risk budgets on an ongoing basis;
 - (v) Expanding asset liability management;
 - (vi) Analysing the results (ex post); and
 - (vii) Changing investments when necessary to align the portfolio with the desired risk level.
53. IFAD's IPS sets the risk budget for IFAD's overall investment portfolio. The risk budget for individual portfolios is set in IFAD's investment guidelines and approved by the President of IFAD, unless otherwise delegated. Additional limits are set in the MLR, investment policies and other internal procedures. Table 2 details the risk measures selected for the risk management framework and their tolerance level as defined in these IFAD policies and guidelines. The table, together with chart 3, also presents the internal procedures established under the risk management framework to monitor and manage the risks within the new risk-budgeting framework.

Table 2

IFAD's investment risks, established limits and control framework*

<i>Risk type</i>	<i>Risk measure and source</i>	<i>Established limit</i>	<i>Monitoring frequency/tool</i>	<i>Reporting frequency</i>	<i>Alert level/action taken</i>
Interest rate risk	Manager's duration (determined in IFAD's investment guidelines)	Duration must be no lower than zero (i.e. divesting into cash, lower limit) and no higher than two years above the benchmark duration (upper limit).	Daily through compliance system.	Monthly in the risk report to the Treasurer and the AVP/FOD. Quarterly in the Report on IFAD's investment portfolio to the Executive Board.	Should the duration upper or lower limit be breached, the issue will be reported by the RCF to the IM, the Treasurer and the AVP/FOD. The IM will immediately liaise with the investment manager to: <ul style="list-style-type: none"> • Verify the reason for the duration position/strategy. • Agree on a reasonable time frame for the manager to restore duration within allowable limits. • Upon execution of required trades, request written confirmation by the manager of the new duration level. <p>The RCF will then re-evaluate the duration level and report to the Treasurer and the AVP/FOD.</p>
	1-year forward-looking ex ante tracking error (determined in IFAD's investment guidelines)	According to the specific investment guidelines.	Weekly through risk management system.	At least monthly in the risk report to the Treasurer and the AVP/FOD. More frequently if the variance is close to the established limit. Quarterly in the Report on IFAD's investment portfolio to the Executive Board.	Should the tracking error on any manager exceed its threshold the issue will be reported by the RCF to the IM team, the Treasurer and the AVP/FOD. The IM team will immediately liaise with the investment manager to: <ul style="list-style-type: none"> • Verify the reasons underlying the discrepancy in tracking error. • If deemed necessary for risk mitigation, agree on a reasonable time frame for the manager to restore tracking error within allowable limits. • Upon execution of required trades, request written confirmation by the manager of the new tracking error.** <p>The RCF will verify the tracking error level and report to the Treasurer and the AVP/FOD.</p>

* Table 2 presents the internal procedures established under the risk management framework to monitor and manage risks within the corresponding risk-budgeting framework. The established limits are detailed only for reference purposes, however the limits might change when the corresponding policy or guideline is updated.

** It should be noted that a high tracking error does not necessarily indicate a higher risk, but only a higher degree of difference when compared with the benchmark. For example, should a benchmark contain sub-prime mortgage-backed securities, a portfolio indexed against this benchmark and not containing such securities may show a high tracking error but a lower risk level in absolute terms.

<i>Risk type</i>	<i>Risk measure and source</i>	<i>Established limit</i>	<i>Monitoring frequency/tool</i>	<i>Reporting frequency</i>	<i>Alert level/action taken</i>
Interest rate risk (continued)	1-year conditional value-at-risk at 95 per cent confidence level (stated in IFAD's IPS and, for individual portfolios, in IFAD's investment guidelines)	Overall portfolio: maximum 3% Individual portfolios: according to the specific investment guidelines.	Monthly through risk management system.	At least monthly in the risk report to the Treasurer and the AVP/FOD. More frequently if alert level for measure is reached. Quarterly in the Report on IFAD's investment portfolio to the Executive Board.	Should the CVaR on the overall portfolio or on any single manager exceed its threshold the issue will be reported by the RCF Unit to the IM, the Treasurer and the AVP/FOD. The following actions will be taken: <ul style="list-style-type: none"> • The RCF will perform a break-down analysis to identify the sources of increased CVaR. • Depending on the result of the break-down analysis, the RCF will recommend to the AVP/FOD and to the Treasurer corrective measures on the overall portfolio or for a single manager. These measures may include, but are not limited to, increasing the cash exposure, decreasing duration and divesting from a certain sector. • The measures will be discussed within TRE and RCF an action plan will be presented to the AVP/FOD and to the Treasurer. • Upon approval, the recommendations will be implemented with the concerned counterparty.
Currency risk	Percentage deviation from target currency ratios	While the aim of the framework is to minimize any variance (i.e. zero variance), any deviation of more than 10 per cent per currency is considered above the absolute limit. <i>(Currently under review)</i>	Monthly through internal analysis.	At least monthly to the Treasurer and the AVP/FOD. More frequently if the variance is close to the established limit. Quarterly in the Report on IFAD's investment portfolio to the Executive Board.	Should the percentage deviation in any single currency exceed the absolute limit, the following actions will be taken: <ul style="list-style-type: none"> • The RCF will recommend a realignment strategy by one of the following tools: foreign exchange transactions on internally managed cash or change in currency composition of one or more of the externally managed individual portfolios. • An execution time frame for the realignment will be communicated by the RCF to the Treasurer and the AVP/FOD and to the concerned teams (the IM and/or the CM). • The concerned party will be instructed to execute the trades. • Upon execution, a new analysis will be performed to verify the realignment of the assets.
Liquidity risk	Percentage of gross disbursement (determined in IFAD's minimum liquidity	Minimum liquidity requirement (composed of IFAD's investment portfolio) set at 60 per cent of the	Quarterly through internal analysis.	Quarterly in the Report on IFAD's investment portfolio to the Executive	Should IFAD's investment portfolio decrease to reach the level of 70 per cent of gross disbursements, the issue will be reported by the

<i>Risk type</i>	<i>Risk measure and source</i>	<i>Established limit</i>	<i>Monitoring frequency/tool</i>	<i>Reporting frequency</i>	<i>Alert level/action taken</i>
	requirement).	total of annual gross disbursements (cash outflows) and potential additional requirements due to liquidity shocks. <i>(Currently under review)</i>		Board.	RCF to the AVP/FOD and the Treasurer and immediately communicated to the Programme Operations Department in order to revise the plan for future disbursements.
Credit risk	Credit rating (determined in IFAD's investment guidelines) and fundamental analysis carried out in-house.	Minimum credit floor in investment guidelines for managed portfolios is BBB- (i.e. investment grade). <i>(Currently under review)</i>	Daily through compliance monitoring system.	At least monthly in the risk report to the Treasurer and the AVP/FOD. On a quarterly basis a credit rating analysis by portfolio will be presented in the Report on IFAD's investment portfolio to the Executive Board.	Should a security be downgraded below IFAD's minimum credit floor, Credit risk is reported and analysed by the RCF. TRE also analyses the credit risk for internally managed investments, and, on a selective basis, for externally managed assets. Credit risk analyses for commercial and central banks are performed by using financial information systems, credit analysis providers and other market sources. Credit risk for securities designated at amortised cost is also monitored by the impairment allowance created to reflect the expected credit loss. Activities are carried out by ACD, TRE and RCF.
Counterparty risk	Credit rating for counterparties (determined in IFAD's investment guidelines).	Minimum credit rating for eligible counterparties.	Monthly through internal analyses.	Ad hoc basis, but if there is a credit event (e.g. downgrade) then a report will be written.	Should counterparty be downgraded below IFAD's minimum credit floor, the issue will be reported by the RCF to the Treasurer, the AVP/FOD and the IM and CM. Immediate action will, as appropriate, be taken with the investment manager. TRE performs analysis of counterparties for all investment activities, including trading, derivatives and banks eligible for investments. Monitoring is also performed on commercial and central banks' credit ratings and financial soundness.
Industry (or Sector) risk (for equities portfolio)	Maximum industry exposure and concentration limits (determined in IFAD's various investment guidelines).	Depending on investment portfolio guidelines.	Daily through compliance monitoring system.	Monthly in investment portfolio reports to FISCO and quarterly to the Executive Board.	Should a country concentration be exceeded, the issue will be reported by the RCF to the Treasurer, the AVP/FOD and the IM and CM. Immediate action will be taken, as appropriate, with the investment manager.

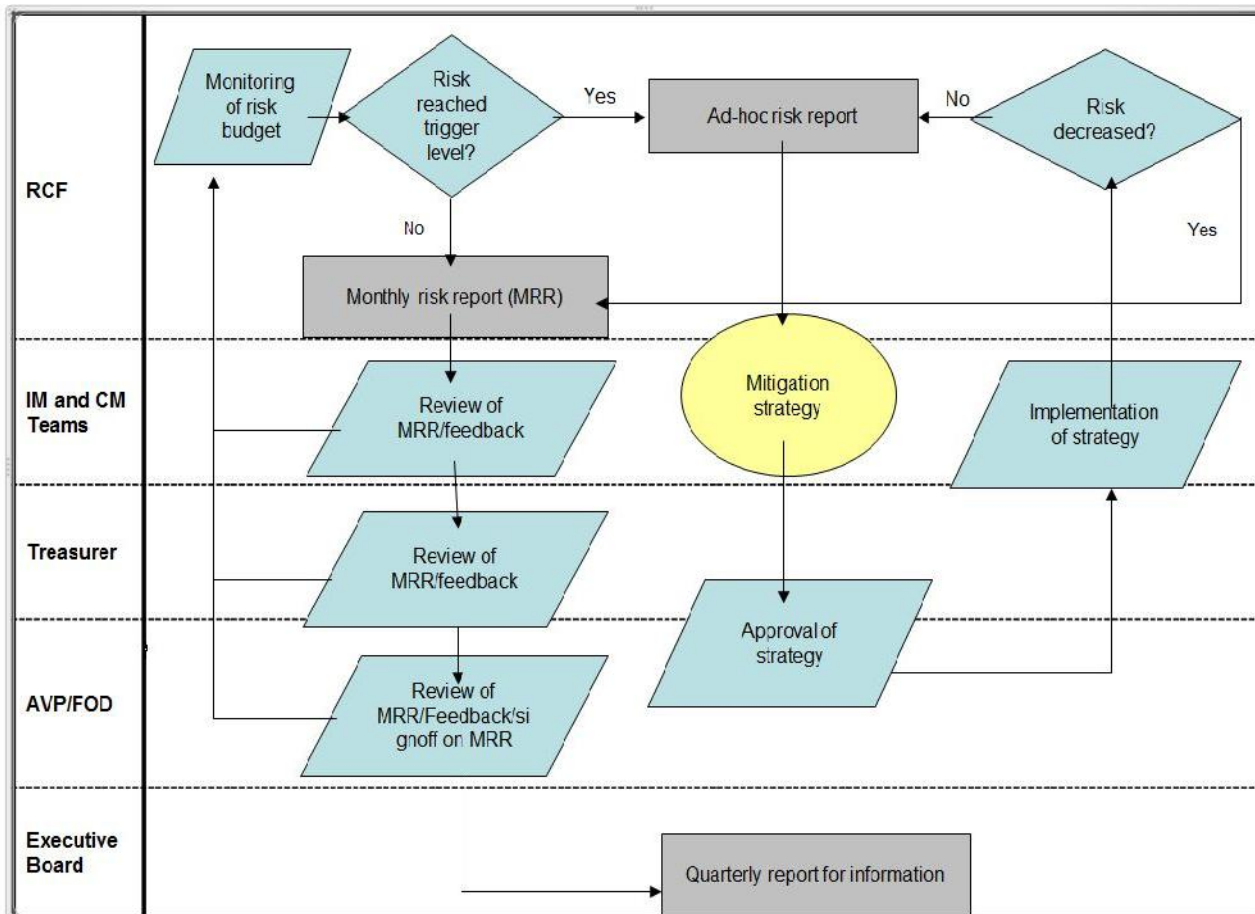
<i>Risk type</i>	<i>Risk measure and source</i>	<i>Established limit</i>	<i>Monitoring frequency/tool</i>	<i>Reporting frequency</i>	<i>Alert level/action taken</i>
Country risk	Maximum country risk exposure and concentration limits (determined in IFAD's investment guidelines).	Depending on investment portfolio guidelines.	Daily through compliance monitoring system.	Monthly in investment portfolio reports to FISCO and quarterly to the Executive Board.	Should a country concentration be exceeded, the issue will be reported by the RCF to the Treasurer, the AVP/FOD and the IM and CM. Immediate action will be taken, as appropriate, with the investment manager.
Operational risk	Segregation of duties within TRE, back-up procedures, legal control (determined in the Treasury Manual and Operational Risk Management for Treasury, and Cash and Investment). Segregation of duties of TRE and the RCF reported in this ICF document and various investment guidelines.	Not applicable.	Continuous.	Annually, through the revision of the Treasury Manual and the Operational Risk report (from 2012).	With regard to payments, segregation of duties for core financial procedures within FOD exists between ACD, Administrative Services Division (ADM) travel unit and TRE. ACD and ADM have the authority to instruct movements of IFAD funds to external parties. The TRE CM unit authorizes the execution of all financial and payment transactions through operational bank accounts. ACD and TRE independently post accounting entries in the Fund's general ledgers which are reconciled on, at least, a monthly basis. With regard to internally managed investments, within TRE segregation of duties exists between the IM which recommends (for the Treasurer's approval) and executes trades, and the CM team which performs trade settlement. RCF independently reports on the investment activities. Additionally, with regard to the investment portfolio, the first level of sign-off is performed between the external portfolio managers and IFAD's Global Custodian, thereby ensuring accountability and segregation of duties. Procedures are reported in the Treasury Manual.

- C. Control, information and communication, and monitoring activities
54. TRE reports externally certain risk measurement metrics and analyses to the Executive Board and the Audit Committee through the quarterly and annual investment portfolio report. Comprehensive monthly risk reports are also produced by the Unit and shared internally with the Treasurer and AVP/FOD, and if deemed relevant, with FISCO.
 55. These comprehensive monthly risk reports inform, communicate and monitor activities that cover the following areas of risk monitoring:
 - (i) Currency risk;
 - (ii) Market and credit monitoring, and risk levels compared to predetermined risk budget levels;
 - (iii) Compliance monitoring versus investment guidelines and subsequent actions if any; and
 - (iv) Portfolio and benchmark performances.
 56. Whenever a risk measure reaches the "alert level", as defined in table 2, the RCF will inform the IM, the Treasurer and the AVP/FOD. Appropriate risk-mitigating strategies will be recommended and actions will be taken, as described in table 2. Upon completion of the actions, the RCF will verify the risk level and report the new level to the concerned parties. The process is illustrated in chart 3.
 57. In addition to the risk measures established in IFAD's IPS for risk-budgeting purposes, a comprehensive set of risk measures is analysed through the risk management system. Whenever one of the risk measures, either on the overall portfolio or on a single manager, is deemed to be excessive or shows a significant change from the previous period, the RCF will bring the issue to the attention of the AVP/FOD, the Treasurer and the IM.
 58. The additional measures (whose definitions are given in annex III) include:
 - (i) Annualized standard deviation or returns by manager, individual portfolio, benchmark and for the overall portfolio and benchmark;
 - (ii) CVaR with a one-year forward-looking horizon and a 95 per cent confidence level, by manager, by individual portfolio benchmark, and for the overall portfolio and the overall benchmark;
 - (iii) Historical monthly CVaR for the historical period of the past two years;
 - (iv) Overall risk decomposition, by risk type; and
 - (v) Risk-adjusted return indicators (Sharpe ratio, tracking error, information ratio, beta and alpha).
 59. ACD executes full data control and reconciliation of financial records against the custodian and/or third parties.
 60. The risks in IFAD's investments are currently monitored with a variety of tools:
 - (i) Enhanced risk management system. IFAD is constantly strengthening its analytical resources to monitor risk in the investment portfolio, and enable the TRE and the RCF unit to perform ex ante analyses as well as stress tests on assets, on the individual portfolios and on individual managers;
 - (ii) Compliance monitoring system. This web-based application supplied by the global custodian enables the RCF to verify on a daily basis the compliance of external portfolio managers with the respective investment guidelines. The majority of guidelines are currently coded in the system, and the application flags breaches or alert levels on a daily basis. Guidelines that cannot be

coded in the system are monitored through internal analyses and manual procedures;

- (iii) Compliance checks on the internally managed portfolios are, for reasons of segregation of duty, performed by the global custodian who alerts the RCF Unit as soon as a breach occurs and produces a monthly report;
- (iv) In addition to the above, the IM performs qualitative analyses on selected issuers and counterparties; and
- (v) Performance reporting by the global custodian.

Chart 3
Flow of control framework for investment risks



Rules of procedure and terms of reference of the Investment and Finance Advisory Committee (FISCO) (high-level committee)

1. Purpose

- 1.1. To assist and advise the President in deciding on strategic financial matters and in determining the overall investment strategy and policy.
- 1.2. The scope of FISCO's review for information and/or for final decision by the President includes:
 - 1.2.1. Financing and resource requirements;
 - 1.2.2. Financing mechanisms;
 - 1.2.3. Investment policy and minimum liquidity requirement;
 - 1.2.4. Financial risk management;
 - 1.2.5. Direct charges against investment income;
 - 1.2.6. Appointment of investment managers and Global Custodian;
 - 1.2.7. Financial market developments;
 - 1.2.8. Any other financial matters deemed strategically important.

2. Membership

- 2.1 The membership of the Committee shall be determined by the President and shall include:
 - The President (Chairperson)
 - Vice-President, Office of the President and the Vice-President
 - Associate Vice-President, Programme Management Department
 - Associate Vice-President Financial Operations Department, Chief Financial Officer and Chief Controller
 - Associate Vice-President, Strategy and Knowledge Department
 - Associate Vice-President, Corporate Services Department
 - Associate Vice-President, External Relations and Governance Department
 - Director and Chief of Staff, Office of the President and the Vice-President
 - Director and Treasurer, Treasury Services Division (Secretary)
 - Director, Financial Management Services Division
 - Director, Accounting and Controller's Division
 - General Counsel, Office of the General Counsel
 - Director, Partnership and Resource Mobilisation
 - Director, Office of Audit and Oversight (Observer)
 - Other members at the discretion of the Chairperson

3. Meetings

- 3.1 Members and observers will attend all meetings. In the event they are unable to attend, qualified representatives shall be designated and communicated in writing to the Secretary.
- 3.2 Other IFAD staff directly concerned with the matters to be discussed may be asked by the Secretary to attend as observers, subject to the approval of the Chairperson.
- 3.3 A quorum shall consist of the President as Chairperson or, in the event of the President's inability to attend, his/her representative (under a specific delegation of authority from the President); the Director and Treasurer, TRE, as Secretary or his/her representative, the Associate Vice-President, Financial Operations Department or his/her representative and four other members of the Committee.
- 3.4 Meetings will be held every eight weeks in conjunction with the regular meetings of the Executive Management Committee, and more often if the business of the Fund so requires.

4. Agenda, documentation and minutes

- 4.1 The Director and Treasurer, TRE, will act as Secretary of the Committee and shall be responsible for the following:
 - 4.1.1 Scheduling meetings;
 - 4.1.2 Drafting the agenda in consultation with the Associate Vice-President Financial Operations Department, Chief Financial Officer and Chief Controller;
 - 4.1.3 Coordinating and distributing documentation to the Committee at least four working days prior to the meeting date;
 - 4.1.4 Providing information on the strategic financial or operational matters indicated in 1.2, as deemed necessary by the Chairperson or FISCO members;
 - 4.1.5 Preparing minutes of the meeting for the Chairperson's approval – which shall include decisions taken by the Chairperson, substantive observations by members, actions to be undertaken by responsible officers – and distributing signed minutes to all participants;
 - 4.1.6 Preparing an updated tracker of actions for the Committee.

Reference to the new principles in the COSO Internal Control – Integrated Framework in the context of IFAD's investment-related activities

I. Control environment

1. The organization demonstrates a commitment to integrity and ethical values: Specific policies and procedures that fall under IFAD's Policy on Enterprise Risk Management (ERM) require (a) an annual certification of compliance with the IFAD Code of Conduct and declaration of non-IFAD income, goods, services or assets; (b) Management assertion and external audit attestation of internal controls over financial reporting; and (c) financial disclosure statement for selected staff members. These points – referred to in section II.C of the ICF – demonstrate a commitment to integrity and ethical values.
2. The board of directors demonstrates independence from Management and exercises oversight of the development and performance of internal control: IFAD's Governing Council, Executive Board and Audit Committee are independent from Management and exercise oversight as referred to in section II.A.
3. Management establishes, with Board oversight, structures, reporting lines, and appropriate authority and responsibilities in the pursuit of objectives: Section II. B describes the investment-related roles and responsibilities of key parties responsible for oversight and decision-making of investment-related activities. Chart 1 illustrates IFAD's governance structure and chart 2, the internal flow of financial information in terms of investments.
4. The organization demonstrates a commitment to attract, develop and retain competent individuals in alignment with objectives: IFAD's Human Resources Implementing Procedures state that "Screening will be conducted with professional rigour ... and selection processes ensuring that candidates are assessed on the basis of the highest standards of competence, integrity, and appropriate experience to carry out IFAD's objectives and avoid potential conflicts of interest."¹²
5. The organization holds individuals accountable for their internal control responsibilities in the pursuit of objectives: Section 3.1 of IFAD's Human Resources Policy¹³ states that IFAD staff accepts responsibility to "discharge their functions and regulate their conduct solely with the interest and objectives of the Fund in view."

II. Risk assessment

6. The organization specifies objectives with sufficient clarity to enable the identification and assessment of risks relating to objectives: The Governing Council adopted the Financial Regulations of IFAD. Regulation VIII, paragraph 2 states that "in investing the resources of the Fund the President shall be guided by the paramount considerations of the security and liquidity. Within these constraints ... the President shall seek the highest possible return in a non-speculative manner".

¹² IFAD's Human Resources Implementing Procedures – Chapter 2: Staff recruitment and appointment 2.3.1(ii).

¹³ See EB 2004/82/R.28/Rev.1.

7. The organization identifies risks to the achievement of its objectives across the entity and analyses risks as a basis for determining how the risks should be managed: Through the IPS the organization identifies an investment universe to achieve the above-mentioned objective as detailed in section III.A, whereby it stipulates asset classes, credit rating floors, durations and corresponding benchmarks. Section III.A identifies various risks (i.e. market risk, currency risk, liquidity risk, credit risk, counterparty risk and operational risk) associated with IFAD's investment portfolio and describes how these risks are mitigated and managed by IFAD. Table 2 summarizes established limits, monitoring/reporting frequencies and what alert actions are to be taken.
8. The organization considers the potential for fraud in assessing risks to the achievement of objectives: IFAD addresses this through its Policy on Preventing Fraud and Corruption in its Activities and Operations,¹⁴ which aims to: "(i) affirm and communicate the Fund's resolve to prevent and combat fraud and corruption in its activities and operations; (ii) describe the ongoing efforts of the Fund in this area; and (iii) outline actions that the Fund will be taking in implementing this policy".
9. The organization identifies and assesses changes that could significantly impact the system of internal control: The annual review of the IPS and ICF provides a framework to identify the adequacy of IFAD's internal controls, which is then reported to the Executive Board and Audit Committee. IFAD's investment committee, FISCO, meets regularly to review emerging challenges and risks and to discuss and endorse mitigation strategies.

III. Control activities

10. The organization selects and develops control activities that contribute to the mitigation of risks to the achievement of objectives to acceptable levels: Sections III.B and III.C stipulate IFAD's risk assessment, controls and monitoring activities to mitigate risks. These are further summarized in table 2.
11. The organization selects and develops general control activities over technology to support the achievement of objectives: Section III.C highlights the control and monitoring activities, specifically in relation to IFAD's risk management and compliance monitoring systems (a web-based application supplied by IFAD's global custodian). Furthermore, IFAD is continuing to develop and improve the internal information technology systems pertaining to financial risks and controls.
12. The organization deploys control activities through policies that establish what is expected and procedures that put policies into action: Section II.C outlines the IFAD investment-related policies and procedures that govern IFAD's investment processes and controls. It makes reference to IFAD's Financial Regulations, the ERM policy, the IPS, the liquidity policy, investment guidelines, the ICF, investment management and master custody agreements, the Treasury Manual and FISCO. Table 2 summarizes established risk limits, monitoring/reporting frequencies and procedures/actions to be taken in the event risk levels are breached.

¹⁴ See EB 2005/85/R.5 and subsequently revised EB 2005/86/INF.8.

IV. Information and communication

13. The organization obtains or generates and uses relevant, quality information to support the functioning of internal control: As summarized in table 2, specifically under column "monitoring frequency/tool", quality information is regularly collated by IFAD to generate compliance and risk reports to support the functioning of internal control.
14. The organization internally communicates information, including objectives and responsibilities for internal control, necessary to support the functioning of internal control: Section II.B. of the ICF, illustrates and details how financial information (in terms of investments) is communicated within the organization. This includes objectives and responsibilities for internal control. Risk levels are also reported to the FOD Management Team. Chart 3 presents the flow of control and communication for investment risks to internal parties including but not limited to the Treasurer and AVP/FOD.
15. The organization communicates with external parties regarding matters affecting the functioning of internal control: The IPS and ICF, together with the annual revisions, provide a channel for the organization to communicate matters affecting the internal control over investment-related activities to external parties.

V. Monitoring activities

16. The organization selects, develops, and performs ongoing and/or separate evaluations to ascertain whether the components of internal control are present and functioning: The effective functioning of internal controls over investments are subject to separate independent reviews by IFAD's Office of Audit and Oversight, together with periodic reviews by IFAD's external auditors.
17. The organization evaluates and communicates internal control deficiencies in a timely manner to those parties responsible for taking corrective action, including senior management and the board of directors, as appropriate: On an annual basis the IPS and ICF is reviewed to identify any potential deficiencies with IFAD's internal controls in relation to its investment activities, with proposed improvements and changes reported to the Audit Committee and Executive Board. Furthermore table 2 summarizes the frequency and timeliness of communicating any investment-related internal control breach to relevant parties, including the Treasurer, AVP/FOD, IFAD's investment committees as well as the Executive Board and Audit Committee.

Glossary of risk measures and related terms

Active risk: The risk a portfolio or fund acquires when it is actively managed, especially when its managers attempt to outperform some benchmark. More specifically, the more a fund or portfolio differs from the benchmark upon which it is based, the more likely it is to underperform or outperform that same benchmark. This extra risk is active risk. For example, a one-year forward-looking active risk of 0.2 per cent means that, over the coming year, the portfolio excess return over the benchmark is expected to be in the range of +/- 0.2 per cent of its mean value.

The active risk can be predictive (or ex ante), based on expected return, or ex post, derived from the actual returns of the portfolio.

Alpha: Alpha is a risk-adjusted measure of the so-called "excess return" on an investment. It is a common measure of assessing an active manager's performance as it is the return in excess of a benchmark index or "risk-free" investment.

Benchmark: A benchmark is a standard against which the performance of a security or manager can be measured. The benchmark should be an investment instrument that has certain characteristics of transparency and replicability so as to best represent the performance of a certain investment universe. In financial markets, the most popular indices are used as benchmarks. For example, the Standard & Poor's 500 is a widely used benchmark for United States "large-cap" equities markets.

Beta: Beta is a measure of the volatility, or systematic risk, of a security or a portfolio in comparison with the financial market as a whole.

Conditional VaR: CVaR is a measure of the average expected loss of a portfolio assuming that the value at risk has been reached. Since assumption is made that the portfolio loss has exceeded the VaR, the CVaR gives an indication about the magnitude of the losses in 'the tails' of the distribution, i.e. in extreme loss cases. The higher the CVaR, the more a portfolio is expected to lose in extreme scenarios and, hence, the riskier it is.

Confidence level: This is the range (with a specified value of uncertainty, usually expressed in percentage terms) within which the true value of a measured quantity exists. It is also the level of certainty to which an estimate can be trusted.

Duration: This is a measure of the sensitivity of a bond's price to changes in the level of market yields. For bonds, prices and yields have an inverse relationship. If the yields increase, the bonds' prices decrease. A bond with longer duration is more sensitive to changes in market yields meaning that, all else equal, its price will decline more for a given increase in yields than the price of a bond with shorter duration.

Fat tails: A fat-tailed probability distribution is one in which extreme events are more probable.

Historical simulation: Historical simulation is a procedure for predicting the values of a portfolio deriving such values from historical portfolio data.

Information ratio: This is a measure of risk-adjusted performance. The information ratio measures the relation between the portfolio's average excess return (in excess of the benchmark return) and its tracking error. A higher information ratio indicates a better reward for the portfolio's tracking error, thereby indicating also more successful investment management skills.

Risk-adjusted return: This is a measure of how much an investment returned in relation to the amount of risk it took on. It is often used to compare a high-risk, potentially high-return investment with a low-risk, lower-return investment. A simple risk-adjusted return measure is dividing the portfolio's annual return by its annual standard deviation. This ratio gives an indication of the amount of return generated by each risk unit. The higher the ratio, the better the risk-adjusted return.

Risk-free rate: This is the theoretical rate of return of an investment with no risk of financial loss. The risk-free rate represents the interest that an investor would expect from an absolutely risk-free investment over a given period of time. Risk-free assets usually refer to short-dated government bonds. For United States dollar investments, usually United States Treasury bills are used; while a common choice for euro investments are German Government bills or the Euro Interbank Offered Rate (Euribor).

Sharpe ratio: This is a measure of risk-adjusted performance. It measures the relation between the portfolio's average excess return (in excess of risk-free return) and its standard deviation. The higher the Sharpe ratio is, the better the reward for market risk.

Standard deviation: This is a measure of the volatility of a certain value around its average. The higher the standard deviation, the more the value is dispersed around its average. In the case of portfolio returns, the higher the standard deviation of returns, the more returns are expected to vary around the average expected return. Therefore, a portfolio with a high standard deviation is considered more risky than one with a lower one, all else being equal.

Value-at-risk: This is the maximum potential loss an investment can incur over a defined time horizon within a specified confidence level. If an investment portfolio of US\$100 million has a three-month VaR of 1.5 per cent with a confidence level of 95 per cent, the maximum amount that could be lost over the next three-month period is US\$1.5 million; and this estimate can be trusted with 95 per cent certainty, meaning that it is expected that the estimate is correct 19 times out of 20 (95 per cent of the times).

Volatility: This is a measure of the fluctuation in the market price of the underlying security. Mathematically, volatility is the annualized standard deviation of returns.