Evaluation of the implementation of National and Regional Research Strategies for a Smart Specialisation (NS3/RS3): Network, Outputs and Expected Results

AD&C
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ÍNDICE

1. FRAMEWORK AND CONTEXT

1. The evaluation of the implementation of National Smart Specialisation Strategy (NS3) and of Regional Smart Specialisation Strategies (RS3) is a particular evaluation exercise, not of a programme or of a policy, but instead of how a specific approach has been operationalised within the 2014-2020 programming framework of regional and thematic programmes. The RIS 3 approach emerged in 2020 programming as an *ex-ante* conditionality that is inseparable from the maturation stage of innovation policies reached through the persistent strategic orientation assumed from 2000-2006 and 2007-2013 programming periods (particularly relevant in the last one).

2. Understood as "*place-based regional economic change agendas*" (Kyriakou, 2017) and as "*a new word to the old phenomena of an economic system being able to generate new specialisations through the discovery of new opportunities and the concentration and agglomeration of resources and competences in these domains*" (Foray, 2015), the NS3/RS3 brought to the evolving innovation policies focus and selectivity of guidelines, priorities and key issues. The progression towards higher selectivity in the allocation of community and national resources must be interpreted as a learning process. Deepening that process will be a relevant inspiration to review NS3/RS3 for the 2021-2027 programming period.

3. The above mentioned maturation of innovation policies is also in line with the evolving consolidation of national innovation systems (NIS) and Regional Innovation Systems (RIS) in Portugal: at national level, through the role of National Innovation Agency (ANI) and at regional level through the different maturity of the RIS of the 5 plan-regions in the mainland and of the autonomous regions of Azores and Madeira. As far as the RIS are concerned, one should highlight the following different characteristics: the Norte and Centro RIS presented a significant evolution determined by public and community innovation policy efforts that is in line with their upgraded *European Innovation Scoreboard* status; the Lisbon RIS was consolidating its transition towards a new funding paradigm based on direct access to community directly managed funds; The Alentejo, Algarve, Azores and Madeira RIS were leading institutional and organizational upgrading processes, starting from very low levels of technologic effort and density of interaction between regional agents.

4. This evolving context explains the strongly participated process of the elaboration of the seven RS3, with a wide and relevant involvement of each RIS actors system, that preceded the conclusion of NS3 itself. This participative process brought to the implementation process a great diversity of *stakeholders*, strongly enlarging the perception of institutional and entrepreneurial fabric about the implications and requirements of the new RIS 3 approach. Within that vast universe of *stakeholders*, it is important to underline that it encompasses different degrees of proximity regarding the identification of firm innovation needs, ranging from those which are close to these needs to those which more far from them (usually more associated to the scientific investigation logics). So, it can be said that the RS3 have been conceived with a large participation of the institutional fabric operating in the different RIS. This participation is as much significant as it has been observed without the previous knowledge about the policy and programming instruments selected to make the NS3/RS3 operational.

5. The programming development would confirm that the operationalisation of NS3/RS3 mobilised a vast set of policy instruments and typologies of operations (TO), that regional operational programmes (ROP) and Thematic Operational programmes (TOP) used in a generally homogenous way. These policy instruments and TO have been divided in two groups: instruments in which to be in line with NS3/RS3 strategic priorities was a necessary condition to be admitted to tenders and instruments in which to be in line with those priorities was a simple merit criteria.

2. EVALUATION OBJECTIVES AND SCOPE

6. Reported to 30.06.2018 (in some cases extended to 31.12.2018), the evaluation purpose consists of analysing how the PT2020 and OP stimulate innovation at national and regional level through smart specialisation criteria, transforming strategic orientations in normative guidelines, leading within the available TO to admissibility and merit analysis conditions of investment projects. Five objectives have been established for the evaluation: (i) to evaluate how NS3/RS3 have been integrated in the PT2020 implementation from the perspective of both achieving the expected objectives and the creating con-

ditions to achieve them; (ii) to evaluate how pertinent the architecture and dynamics of the continuous implementation of NS3/RS3 has been, mainly in terms of the creation of innovation ecosystems; (iii) to evaluate the implementation process, the adequacy and effectiveness of the multi-level governance model; (iv) to make explicit the expected generation of effects linked to RIS 3 interventions; (v) make recommendations in order to improve the effectiveness of the processes leading to smart specialisation. From the programmatic point of view, the evaluation encompasses the OP COMPETE, the OP HUMAN CAPITAL, the OP Norte, Centro, Alentejo, Algarve, Azores, Madeira, the Rural Development Programme (RDP) for the mainland, the RDP's Azores and Madeira, the OP SEA. The thematic scope corresponds to the thematic objectives TO1, TO3, TO8 and TO10, involving the Investment Priorities/Categories of Intervention (CI) established in the OP texts. The evaluation also encompassed other TO/CI of OP and Rural Development Programme (PDR) measures mentioned in the formulation of NS3/RS3.

3. METHODOLOGY

7. Conceived as a "theory-based evaluation", complemented with the "contribution analysis" inspiration, the evaluation of the implementation of NS3/RS3 designed, through a long and detailed interaction process with the Evaluation Follow-up Group (holding a specific workshop for this purpose) a Theory of Change (ToC), robust and capable of being operationalised through consistent and diverse procedures for collecting and processing information, to explain the changes targeted by the implementation of RIS 3 approach and, simultaneously, to be a guide to answer the evaluation questions. The ToC framework allows to take into consideration: (i) the link between what has been implemented and planned; (ii) the influence and conditioning effect of context in the implementation process of the intervention; and (iii) the effective capacity of the implementation process of the intervention to activate (or not) the mechanisms identified by the ToC.

8. The scope of the ToC is also illustrated by its ability to guide the answer to the diversity of evaluation questions (EQ): (i) how adequate are the tendering processes, the analysis and selection of projects (for example, calls to present projects, forms, selection criteria, admissibility conditions) and contractualisation to achieve the NS3/RS3 objectives?; (ii) are the NS3/RS3 management mechanisms (information, animation and communication, capacitation of public agencies, follow-up and monitoring) facilitating the achievement of objectives? (iii) how adequate and influent are the NS3/RS3 governance models to implement them within the PT2020? (iv) are the NS3/RS3 being able to foster the pertinent environments to increase entrepreneurial discovery processes and develop the RIS? What are the success critical factors /main obstacles (animation, information, organisational culture of the institutions involved …); (v) what is the role played by ESIF in achieving the NS3/RS3 objectives (considering their design and first outputs)? (vi) what is the expected contribution of NS3/RS3 to achieve the national objectives and goals for Europe 2020 Smart Growth? What are the main critical factors/bottlenecks?

9. As it has been conceived, the ToC is the framework for all the evaluation methodology and it is prepared for focusing in the additional contribution that NS3/RS3 bring to the maturation processes of innovation policies and to the internationalisation of the Portuguese economy itself (innovation within a context in which the resources allocation is strongly oriented towards tradable goods). The changes induced by the implementation of NS3/RS3 are always confronted with the hypothetic maturation of innovation policies without the additional contribution of NS3/RS3 focus and selectivity. The complete formulation of the ToC includes the specification of activities and sub-activities, the identification of the mechanisms needed to transform activities into outputs and of the mechanisms to transform outputs into results (1st and 2nd level), always associated to the critical factors that could disturb the results of those changes.

10. The application of the ToC and of its set of mechanisms and constraints to describe the desired transformation is combined with a vast group of procedures and methods for collecting and processing information:
    (i) the exhaustive analysis of all the materials produced and published regarding the monitoring and implementation of OP, including the data generated by the OP information systems, principally regarding the preparation and monitoring of NS3/RS3, evidence about how governance models evolved, the degree of commitment, approval and implementation of the TO selected to implement the RIS 3 approach and all the material concerning calls and merit analysis; (ii) a double and combined

survey addressed to promoters of projects and organisations involved in the full universe of TO mobilised to implement the RIS 3 approach; (iii) a comparative analysis of three case studies (CS) of RS3 (Centro, Alentejo and Madeira Autonomous Region), completed and enhanced by additional information about the Algarve RS3, the *benchmarking* analysis of Spanish regions and by complementary elements about Lisbon RS3; (iv) CS of PRODUTECH cluster and of CENTIMFE (a technologically-based infrastructure) and their interaction with NS3/RS3; (v) a discussion panel targeted at a preliminary analysis of the ToC, another discussion panel with institutions integrated in National Scientific and Technologic System and another one integrated in RS3 Alentejo CS with institutions participating in the Alentejo Regional Technology Transfer System; (v) in-depth interviews with stakeholders actively participating in the RIS 3 approach implementation, highlighting a long exploratory meeting with Coordination and Regional Development Commission (CCDR) Norte staff and the Board of Directors of Norte ROP, another with similar composition at CCDR Alentejo and ROP Alentejo and two interviews with ANI.

11. One should highlight the statistical significance of the survey results, mainly concerning the survey to promotors of projects: (i) concerning the survey addressed to projects – Total universe - 15.290; surveys sent- 14.542 (to contacts with more than 5 projects only 5 surveys have been sent); devolutions - 1.033 *e-mails* returned; total of valid surveys sent: 13.509; answers – 816; a result for 95% confidence interval, margin error of 3,39%; (ii) concerning the survey addressed to institutions – Total universe- 8.718; devolutions - 523 *e-mails* returned; total number of valid surveys sent - 8.195; answers – 313; result for a 95% confidence interval – margin error of 5,54%.
12. The evaluation exercise, concerning the comparative CS of Centro, Alentejo and Madeira RS3, identified the differences and adaptability conditions of the RS3 governance models as a main explaining factor of results achieved by each RS3.
13. The difficulties and constraints in exploring data made available through the information systems supporting the Managing Authorities (MA)were a transversal critical factor to all the evaluation work and ToC application, concerning particularly the building of the indicator system conceived as a ToC element. Although recognising the significant efforts of the Managing Authorities to provide that information, the difficulties faced by the evaluation team to homogenise data determined that a not irrelevant number of indicators proposed by the methodological framework could not be applied or be only applied to some RS3. In these cases, the evaluation has always tried to compensate that impossibility assembling qualitative information emerging from the comparative CS. Strongly linked with these constraints, the monitoring materials collected were incipient (practically the RS3 Centro Monitoring Working Papers and the late, concerning the timing of this evaluation, 1st NS3 Monitoring Report).

4. MAIN CONCLUSIONS

14. The main conclusions drawn by the evaluation exercise are based on two grounding elements: (i) the combined use of the different procedures for collecting and processing information to approach the EQ (always encompassing a synthetic answer and analytical developments) and (ii) the combined and transversal interpretation of all the answers to the EQ. When pertinent and feasible, the evaluation invoked another evaluation studies with which the articulation of the results has been considered viable, worked on appropriate and updated context indicators and mobilized the most representative literature of innovation economics to complete the grounding of our own conclusions.
15. Political actors, on one side, and technical staff of ANI, CCDR, Regional Governments and institutions integrated in the National Scientific and Technologic System, on the other side, revealed a very different perception of the requirements and potential of RIS approach. The different perceptions partially explain the difficulties observed in the NS3 preparation process. Considering this context, the processes leading to the elaboration of RS3 represented a good practice of assembling collaborative efforts and institutional cooperation. The early collaborative practices, not always managed with the rhythm and continuity required by the RIS 3 approach, have been achieved without the anticipated knowledge of the instruments that programming would select to implement NS3/RS3. Considering the involvement of the most representative and influent members of each seven RIS, that practice should be seen as a relevant asset to an in-depth revision of RS3.
16. The learning lessons emerged from the vicissitudes faced by the NS3 preparation and the strong interaction observed between ANI and regional authorities to elaborate the 1st NS3 Monitoring Report allow to anticipate that combining the enhancement of the collaborative experience in preparing RS3

with a closer articulation with the NS3 revision will favour a higher level of collaborative practices in the next programming period, certainly leading to more operative strategic frameworks.

17. The RS3 participative inception processes cannot be dissociated from the RIS degree of maturity. RIS 3 approach has been implemented in a stage of strong maturation of research and technological development policies and through that path of the RIS, obviously with significant differences in innovative performance and in systemic interaction between them. The Norte, Centro and Lisbon RS3 institutional animation and inception processes are in line, as expected, with the higher maturity degree of the their RIS. However, the comparative CS shows that, as far as the cases of Alentejo, Algarve and Madeira are concerned, presenting RIS with lower maturity and higher productive specialisation constraints, the RS3 elaboration processes also led to favourable institutional contexts to allow that the implementation of those RS3 could evolve in a collaborative mode and contributing to consolidate their RIS.
18. The high maturity of R&D and innovation policies has ambivalent effects. On one hand, the achieved maturity is a context conducive to a RS3 choices and selectivity environment. On the other hand, tends to generate an increasing returns situation. The more elaborated cases of systemic interaction will tend to be those that will profit more of the RIS 3 approach potential. No accidently, the clusters that went on working on a dynamic mode, despite the devaluation registered by the "clusters" policy instrument, benefitted from the RIS approach and of the previous level of collaborative practices intensity. Additionally, the evaluation collected evidence that the more dynamic NUTS III, with higher level of technological effort, represented in Norte and Centro RIS are those that are also more represented in programming instruments and TO in which to be in line with RS3 is a condition to be admitted.
19. In line with RIS different degrees of maturity, the RS3 have been designed as a strategic framework for choices and priorities in terms of scientific and technological and innovation developments, that the OP Managing Authorities were due to operationalise. Following a highly standardised model among the regions, the PT2020 programming opted for mobilising a vast array of Investment Priorities (IP) and of TO in which to be strategically in line with NS3/RS3 was a necessary condition to be admitted, substantially enlarged with a set of TO in which to be in strategically in line with NS3/RS3 was a simple merit criteria. Not ignoring the different regional policy regimes (Norte, Centro, Alentejo and Azores versus Lisbon, Algarve and Madeira) and also the implications of Azores and Madeira being Autonomous Regions, the OP opted for a convergent, with small differences between them, mobilisation of TO. The evaluation registered the operative problems faced by the MA in transforming the NS3/RS3 strategic orientations in operative guidelines to support the merit content of the articulation with NS3/RS3 strategic priorities, either to consider valid the link with the NS3/RS3 or to give it a merit classification. These difficulties cannot be dissociated from the way priority domains of each RS3 have been formulated and specified, area in which the homogeneity of processes is lower.
20. Analysing the approved operations, the ROP succeeded, in general, to find a solvent demand covering their strategic priorities, using either TO in which to be in line with RS3 is a condition to be admitted or TO in which that articulation is simply a merit criteria. As far as the latter are concerned, there is evidence that they succeed to achieve some complementarity with the former. These results have been achieved without evidence that the modality of specific calls has been frequently used.
21. For a very wide set of priority domains, the NS3 implementation shows high levels on concentration of eligible investment approved in a small group of domains, revealing a variable composition among TO, but with relevant figures for health, production technologies and ITC. As far as the closer to scientific research TO are concerned, there is a high conformity with the distribution pattern of R&D institutional sector. The implementation of RS3 by priority domains, although not easily comparable between them and with the NS3, doesn't show significant cases of non-coverage of established priority domains. There is evidence of complementarity between the results of the two groups of TO, those in which to be in line with RS3 is a condition of admissibility and those in which it is only a merit criteria.
22. Although it is understandable that the support to qualified and creative entrepreneurship represents a TO in which to be in line with RS3 is only a merit criteria, there is few evidence that the demand for these TO is monitored and stimulated considering the opportunities opened by the NS3/RS3 priorities and by the related variety conditions that would be important to foster.
23. Despite the evaluation conclusion that 15% of the eligible investment approved in TO requiring the strategic conformity with NS3/RS3 as a condition of admissibility will be located in low density territories and considering that not all the RS3 fix innovation in low density territories as a priority, seems

that the allocation of resources in TO more associated with local development is not closely in line with the way how RS3 integrate the issue of low density territories. So, there is room for a more coherent approach of this issue in future programming, as for example the overcoming of SI2E implementation problems and a more explicit consideration of the opportunities generated by RS3 in low density territories.

24. The dynamic performance of management models of the NS3 and of the seven RS3 is characterised by a generalised scarcity in technical human resources endowment that coexists with examples of overlapping roles played by these technical structures observed in some programming stages, penalizing the make-up of monitoring processes and the consolidation of data bases to make these processes operative.
25. In this context of human resources scarcity, one should highlight the differences of management models (and also of the governance models) observed between the seven RS3, principally regarding the inducement of investment demand to be supported by the TO that operationalise RIS 3. Ranging from the use of collaborative platforms emerged as a result of RS3 inception period as partners to induce that demand (Centro and in part Lisbon) to the creation of a specialised agency (ARDITI in Madeira) it is also possible identify other intermediate examples: there are the cases of the not yet fully developed experience of the Alentejo Regional Transfer of Technology System and of the relevant role played by CRIA – University of Algarve, as well as bilateral models of interaction with several institutions targeted at inducing demand. In all these situations, we find evidence that RS3 management models are aware of the need to adapt management models to the characteristics of SRI concerning the systemic interaction density.
26. Evaluation identified differences between the seven RS3 governance models that are closely linked with the already achieved level of systemic interaction by the RIS. One important systemic development factor of the SRI, strongly explaining the comparison Norte and Centro versus another RS3 is the significant presence in programming of organisations integrated in National Scientific and Technologic System (NSTS) playing a regional structuring role in stimulating collaborative practices (as for example INESC TEC, Pedro Nunes Institut or Biocant). To these cases one may add the role of the still proactive clusters developing close links with Norte and Centro regions. In our view, the lower co-funding rates offered by ROP Lisbon explain why Lisbon doesn't reveal a similar trend, although it is compensated by a higher intensity of participation of NSTS institutions located in Lisbon in European projects.
27. Evaluation collected evidence that the coordination and governance models formally and legally created to govern NS3/RS3 are highly enhanced by complementary governance modalities inspired by the particularities of each RIS. It is an evidence of the adaptive capacity of RS3 governance models, rejecting rigid solutions and conceiving governance models fitting the characteristics of each RIS.
28. The actual implementation stage of NS3/RS3 produced incipient results concerning "Entrepreneurial Discovery Processes (EDP)", *related variety*-based. Concerning the implementation of NS3, the EDP environments are absent, as stressed by the NS3 monitoring report. Regarding the RS3, the related variety environments are also incipient, with the exception of the dynamics generated by "Mobilising Programmes" and by the also called *complete consortia* that animate these programmes, although not ignoring the difficulties observed in building these kinds of consortia.
29. Regarding the contribution of ESIF, an expeditious contrafactual reasoning shows that without that contribution the instruments targeted at making the NS3/RS3 operational wouldn't be significant. As far as the multi-fund logics is concerned, the calls dedicated to invoke and reward the integration, for example of ERDF and ESF supports are residual. The discussion panel with institutions integrated in NSTS revealed that the great majority of the institutions participating in the panel perceived the integration potential of several instruments, but the multiplication of calls is seen as a disincentive. The definition of a so vast range of TO that can be mobilised to implement RS3 is not a guarantee by itself of achieving the intended *policy mix*.
30. The great transformation objectives to which NS3/RS3 aim to contribute for concern the intensification of smart growth, the value chain upgrade and the intensification of collaborative practices. The contribution for those great objectives is mediated by the achievement of 1st and 2nd level results. The **1st level** are – intensification of knowledge production and of R&D in RS3 priority domains; sustained dynamics of related variety processes; sectorial and territorial Collective Efficiency Strategies; high-skilled human resources training; operative coordination and monitoring of NS3/RS3; the **2nd level** are – enhancement of national productive specialisation structural change process and increase of knowledge intensity; intensification of transfer and enhancement of knowledge; consolidation and

higher systemic maturity of RIS; increase of entrepreneurial absorption of advanced human resources.

31. Regarding **the link between the 1st level results and their contribution to achieve the great transformation objectives**, the results concerning the "intensification of knowledge production and of R&D in RS3 priority domains" should be highlighted, with a significant correlation between the magnitude of approved eligible investment in Investment Priorities 1.1 and 1.2 and the technological effort measure by the indicator "R&D/GDP" by NUTS III. The Norte, Centro and Lisbon RIS more dynamic NUTSIII are strongly represented in TO in which to be in line with NS3/RS3 is a condition of admissibility. Analysing the approved operations, the RS3 strategic priorities are in generally covered by approved demand, although the coverage of these priorities is clearly concentrated in some of them. It is also relevant to stress that, analysing the three or the five strategic priorities with higher demand for TO in which to be strategically in line with NS3/RS3 is a simple merit criteria, there is evidence of complementarity with the results of TO in which the integration in NS3/RS3 is a condition of admissibility.
32. Regarding the **2nd level results associated with the NS3/RS3 implementation**: (i) concerning the reinforcement of regional productive specialisation structural change and knowledge intensity levels, the increase of the business R&D intensity stimulated through TO in which to be strategically in line with NS3/RS3 is a condition of admissibility and the support to related scientific research will tend at long term to influence, principally in the more dynamic NUTS III, the knowledge intensity of regional specialisation profile, although the effects on the value chain upgrade are not yet visible; (ii) the intensity of knowledge transfer to firms will certainly increase concerning the RS3 priority domains in more mature RIS; (iii) the Norte, Centro and Lisbon RIS will present an unambiguous consolidation; (iv) there is evidence that territories with lower entrepreneurial density are not completely out of investment processes in line with RS3; 15% of approved eligible investment through TO in which to be strategically in line with NS3/RS3 is a condition of admissibility is located in low density territories, although the evidence that the enlargement of territorial competitiveness base is not yet solid; (v) the increase of high-skilled human resources in line with NS3/RS3 priorities evolved at a higher rhythm than its absorption by firms, although we expect that the positive evolution of human resources in entrepreneurial R&D activities observed between 2013 and 2016 will tend to continue.
33. The expected contribution of RIS 3 approach to the operationalisation in PT2020 will be more significant concerning the intensification and selectivity of dynamics that were already evolving in terms of entrepreneurial R&D and collaborative practices. The evaluation has not collected satisfactory evidence that the unambiguous intensification of collaborative practice has effectively evolved in a *related variety* environment and that is associated to a real upgrade of value chain. The "mobilising programmes" are the most solid evidence of *related variety* examples.
34. Considering the territorialisation of information completed by the evaluation and the stage transition presented by several NUTS III in terms of technologically efforts (R&D expenditures), there is evidence that the RS3 implementation in Portugal will correspond to effective "place-based regional economic transformation agendas", with heterogeneous maturity and whose rhythm and scope gaps will require specific monitoring in the future.

5. RECOMMENDATIONS

Monitoring issues

35. Taking into account the evidence collected and the results of the 1st NS3 Evaluation and Monitoring Report, the evaluation recommends that NS3 governance model should be completed and that processes targeted at fostering EDP be developed, at least regarding NS3 domains that revealed higher demand and mobilised a more diversified array of policy instruments[1]. The evaluation also recommends that the next edition of the NS3 Monitoring Report should be prepared in strict convergence with the consolidation of RS3 monitoring processes, that, with the exception of Centro RS3, and re-

[1] After having already completed the formulation of these recommendations, the evaluation team registered that ANI organised the first event focused on EDP spirit.

cently the North RS3 as well, are still very incipient and not influencing the MA -decision making procedures. The distinction between the intensification of collaborative practices in general and those evolving in a true related variety environment should be addressed by the monitoring activities.

36. In line with the previous recommendation, the evaluation also recommends the acceleration of RS3 monitoring, offering to management and governance models materials to animate the implementation and elements to exploit the still existing commitment opportunities in programming. The simple existence of methodological monitoring reports, some of them presenting sophisticated indicators, is not a sufficient condition to have operational and effective monitoring processes. The difficulties faced by this evaluation in homogenising and making the information provided by the ROP MA compatible are an evidence of the thorough work which is expected in order to format and make data bases operative to monitoring processes. That work should be done in articulation with the progression of the NS3 monitoring process, about which there is evidence that CCDR and ROP MA actively participated.

37. The evaluation also recommends that in articulation with NS3 monitoring process, the RS3 implementation monitoring could also incorporate elements about the participation of regional *stakeholders* in community programmes (as Horizon 2020) and the involvement in national programmes (SIFIDE and *Born from Knowledge*, for example) regarding projects capable of reinforcing the internationalization of RS3 priority domains.

38. Organising panels of projects seen as structuring, from the perspective of the generated results, could be a priority for monitoring processes, complementing the more comprehensive batteries of indicators, and supporting a more usual practice of launching specific calls.

39. Concerning the monitoring of the RS3 implementation dimensions mobilising TO in which to be strategically in line with RS3 is only a merit criteria, the number and percentage of projects in line with RS3 should be calculated. This is an important way to establish a permanent articulation between fostering EDP's and support to entrepreneurship in general. The evaluation team sustains that there is room and opportunity for specific calls linking the support to qualified and creative entrepreneurship to EDP animation strategies that RS3 want to stimulate. The use of specific calls modality would allow to separate the support to entrepreneurship as an instrument to implement the RS3 from the support to entrepreneurship in general in each region beyond the RS3 transformation objectives.

Specific calls

40. It is also recommended that within the NS3 Coordination Council or the informal spaces of discussion/articulation between the OP and follow-up technical staff, the RS3's management models debate the reasons why the instrument "specific calls" has not been used in a more vast and frequent way and intensify its use.

Low density territories

41. Although not ignoring, as it has been underlined by the evaluation, that low density territories are not absent from the typology operations in which to be in line with NS3/RS3 priorities is an admissibility condition - at least concerning the RS3 Centro, in which the territorial cohesion agenda is part of the RS3 itself - the evaluation also recommends that monitoring should not only analyse the spatial incidence of projects, but also whether or not they put into practice natural resources enhancement strategies of their specific assets through higher intensity of knowledge incorporation. The value chain results of approved operations should be explicit and well communicated, taking advantage of how the priority of enhancement endogenous natural resources has been established in the RS3. The scope of related variety in these territories could be reconsidered through it, opening among other possibilities, the increase of co-operation with R&D institutions located in more dense territories.

42. Regarding the PT2030 programming and the RS3 revision, a broad and well evidenced discussion about the effects of each RS3 in low density territories should be carried out with the participation of regional stakeholders, involving principally the MA of OP Norte, Centro, Alentejo and Algarve, ; considering that the establishment of priority domains will naturally tend to benefit the territorial concentrations of assets to be enhanced, it would be important that each RS3, taking into account the singularities of each region, could discuss how to minimize the uneven development risks, fostering

the integration of the main critical masses of regional resources (of knowledge and innovation) in these territories.

Communication

43. Regarding the communication policies of the OP and RS3 themselves, the projects showing evident signs of *related variety* increase and *value chain* upgrade for regional economies could be highlighted, generating demonstration and operationalisation effects of *related variety* concept.

Policy-mix

44. The OP MA could, through *specific calls*, appeal for a higher incorporation of "*policy mix*", increasing the classification of projects able to be articulated with other national programmes and sectorial policies (health and transports, for example) and community programmes, and also stimulating the combined mobilisation of different OT. Those calls should be explicit regarding the concrete articulation that they want to improve, considering that these sectorial policies are less familiar with RIS 3 mechanisms. The operations showing effective mobilisation and integration of different policy instruments, either involving instruments co-funded by ESIF or relevant sectorial policies should have a major support. The possibility of OP support capacitation processes to prepare tenders and increase the participation in international networks to facilitate the access to programmes directly managed by the EC, as for example HORIZON 2020, should be considered.

45. Based on the results of this evaluation, on the first results of NS3 monitoring and on the preliminary results of RS3 monitoring processes, the NS3 National Coordination Council and the PT2020 Incentive Systems Network could simplify the Investment Priorities and Policy Instruments typologies for which to be in line with NS3/RS3 priorities is a simple merit criteria, improving the operative mobilisation of the "*policy-mix*".

About the establishment of differentiating priorities and strategic key issues

46. The analysis of the implementation of NS3 and RS3 by priority domains highlights that it is possible to improve the way the RS3 formulate the priorities, improving their denomination and their contents in order to facilitate the comparison between national and regional priorities. This revision is not a substitution for the longer term target of formulating priorities for technological development that are more close to national and regional innovation capabilities, working for example with the taxonomies and classifications used for registering and measuring patents level, which are the more popular indicator for measuring technological outputs. Exploring the analysis by priority domains, the evaluation recommends that those domains less represented in approved demand results should be evaluated more in-depth, either discussing the realism of being considered as a priority or developing animation processes for stimulating a higher involvement of potential demand (as for example the cases of sea economy in Norte RS3 or social innovation technologies in Alentejo RS3).

47. Following the same path of exploiting the results of the analysis by priority domains, the evaluation also recommends that the consideration of tourism and its links with regional cultural and symbolic heritage as a NS3/RS3 priority domain should be discussed, in order to achieve higher specification of related variety and technological development processes that RS3 want to implement.

Management and governance models

48. One of the more robust conclusions of the evaluation concerns the virtuous link that exists between the characteristics of the RIS in which the RS3 evolve and the institutional flexibility of the governance model, which represents an important factor to minimise the risks of uneven development, concerning the maturation of the different RIS that the RS3 approach may generate. In this context, the evaluation recommends that within the framework of the NS3 National Coordination Council and of the PT2020 governance model, also involving the AD&C coordination and supervision role, it would be important to create conditions for a closer articulation of RS3 governance models with the RIS characteristics. being more sensitive to result indicators that reflect better the starting structural conditions in which RS3 are implemented.

49. The evaluation recommends that technical staff supporting the follow-up and monitoring of RS3 implementation and the merit analysis of the submitted projects should be strengthened, increasing specialised division of functions.

50. The ROP MA should reinforce technical staff resources in order that projects merit analysis related tasks and the organisation of RS3 implementation monitoring processes could normally interact in a non-conflictive use of time.

NS3/RS3 and sectorial/regional collective efficiency processes

51. Sectorial/regional collective efficiency processes should be reinforced in programming, principally involving the "*cluster policy instrument*", mainly those concerning clusters operating in NS3/RS3 priority domains, in order to take full advantage of focusing collaborative processes that sectorial/regional collective efficiency strategies tend to facilitate. This recommendation is well grounded in the evidence collected by the evaluation as PRODUTECH and CENTIMFE case studies and the evaluation survey show the more resilient clusters are those presenting higher collaborative intensity.

Policy instruments to mobilise

52. Concerning the PT2030 inception phase and the new cycle of implementing NS3/RS3, it would be important to diminish the number of OT related to NS3/RS3 implementation, in order to facilitate just-in time monitoring processes of their effects and of the synergy potential between policy instruments.

NS3/RS3 and other instruments supporting innovation

53. The central administration bodies charged of following-up and managing administrative procedures of community-managed instruments (mainly HORIZON 2020) and other national policy instruments like SIFIDE (fiscal incentives to innovation) or other funds supporting R&D and innovation are advised to elaborate and publish periodic reports territorialising grants by NUTS II, in order to align that information with the progression of RIS fostered by OP COMPETE, OP HUMAN CAPITAL and ROP.

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Matosinhos

R. Tomás Ribeiro, nº 412 – 2º

4450-295 Matosinhos Portugal

Tel (+351) 229 399 150

Fax (´351) 229 399 159

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Lisboa

Av. 5 de Outubro, nº77 – 6º ESq

1050-049 Lisboa Portugal

Tel (+351) 213 513 200

Fax (+351) 213 513 201

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geral@quaternaire.pt

Cofinanciado por: